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TECHNICAL REPORT NO. 3-753

# TRAFFICABILITY CLASSIFICATION OF THAILAND SOILS

by

M. P. Meyer



January 1967

Sponsored by

Advanced Research Projects Agency  
Directorate of Remote Area Control

Service Agency

U. S. Army Materiel Command

Contracted by

U. S. Army Engineer Waterways Experiment Station  
CORPS OF ENGINEERS

Vicksburg, Mississippi

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TECHNICAL REPORT NO. 3-753

# TRAFFICABILITY CLASSIFICATION OF THAILAND SOILS

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M. P. Meyer



January 1967

Sponsored by

Advanced Research Projects Agency  
Directorate of Remote Area Conflict  
Order No. 400

Service Agency

U. S. Army Materiel Command  
Project No. 1-V-0-21701-A-046  
Task 02

Conducted by

U. S. Army Engineer Waterways Experiment Station  
CORPS OF ENGINEERS  
Vicksburg, Mississippi

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#### FOREWORD

The study reported herein constitutes a portion of the Mobility Environmental Research Study (MERS), sponsored by the Office, Secretary of Defense, Advanced Research Projects Agency (ARPA), Directorate of Remote Area Conflict, for which the U. S. Army Engineer Waterways Experiment Station (WES) is the prime contractor, and the U. S. Army Materiel Command (AMC) is the service agent. The broad mission of Project MERS is to determine the effects of the various features of physical environment on the performance of cross-country, ground-contact vehicles and to provide therefrom data which can be used to improve both the design and employment of such vehicles. One criterion of the project is that the data be interpretable in terms of vehicle requirements for Southeast Asia. Most of the funds employed for this study were allocated to WES through AMC under ARPA Order No. 400. The remaining funds were provided by the Directorate of Research and Development, AMC, as part of Department of the Army Project No. 1-V-0-21701-A-046, "Trafficability and Mobility Research," Task 1-V-0-21701-A-046-02, "Surface Mobility."

The study was performed by personnel of WES during the period August 1964-May 1966. The study was assigned to the Army Mobility Research Branch (AMRB), Mobility and Environmental (M&E) Division. Mr. M. P. Meyer had the primary responsibility for the general conduct of the study including the preparation of this report. Mr. J. G. Kennedy programmed the data for computer analysis. Mr. G. T. Ellis compiled the data and assisted in the analysis. Mr. C. A. Blackmon wrote the appendix. Others assisting in the study include Messrs. S. M. Hodge, J. E. Lee, and H. D. Molthan. All phases of the study were under the direct supervision of Mr. E. S. Rush, Chief of the Trafficability Section, AMRB, and the general supervision of

Dr. D. R. Freitag, Chief, AMRB; Mr. A. A. Rula, Chief, MERS Branch; Messrs. W. G. Shockley and S. J. Knight, Chief and Assistant Chief, respectively, M&E Division; and Mr. W. J. Turnbull, Technical Assistant for Soils and Environmental Engineering.

Directors of the WES during the conduct of this study and the preparation of this report were Col. Alex G. Sutton, Jr., CE, and Col. John R. Oswalt, Jr., CE. Technical Director was Mr. J. B. Tiffany.



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## SUMMARY

The study reported herein consisted of a statistical analysis of the principal factors that influence soil trafficability and the application of the analysis to the development of a scheme for classifying soils under generally wet conditions in Thailand. The scheme is essentially a listing of soil types (in terms of the Unified Soil Classification System and the U. S. Department of Agriculture textural classification system) in decreasing order of median rating cone index. Means and ranges are given for each soil type in high- and low-topography positions for average and highest soil-moisture conditions during the wet season. The probability of successful negotiation of a soil type by military vehicles can be ascertained by comparing vehicle cone indexes with the frequency distribution of rating cone indexes for the soils. Results of the studies performed in the development of the trafficability scheme are summarized as follows:

- a. The probability of "go" for a given vehicle over a given soil type is higher on high topographic positions than on low topographic positions; on low topographic positions the probability of "go" is lowest during times of maximum soil-moisture conditions. For a given topography-moisture condition the probability of "go" decreases for USCS soils in the following order: clean, coarse-grained soils, coarse-grained soils with fines, fine-grained soils, and organic soils.
- b. Soils in Thailand have slightly higher strengths under wettest soil-moisture conditions and slightly lower strengths under average soil-moisture conditions during the wet season than do soils in humid-temperate areas of the United States.

# TRAFFICABILITY CLASSIFICATION OF THAILAND SOILS

## PART I: INTRODUCTION

### Background

1. The study reported herein is a part of an extensive investigation conducted to develop techniques and procedures for determining off-road soil conditions in Thailand and a graphic means of presenting these conditions which will show the relations between vehicle mobility, soil type and moisture content, and slope. This study consisted of a statistical analysis of the principal factors that influence soil trafficability and the application of the analysis in developing a scheme for classifying Thailand soils under generally wet conditions. The scheme presented herein is essentially the same as that reported in a previous WES publication.<sup>1</sup> The major differences are that this scheme is applied to a more restricted area, and some refinement of analytical procedures has been made.

### Purpose

2. The purpose of this study was to develop a scheme for classifying the trafficability of Thailand soils in the wet season based on identification of the soils in terms of the Unified Soil Classification System (USCS) and the U. S. Department of Agriculture (USDA) textural classification system, general topographic data, and two general levels of soil-moisture content.

### Scope

3. Trafficability data collected at 846 sites in Thailand on coarse-grained soils with fines and fine-grained soils of the 0- to 6- and 6- to 12-in. soil layers were statistically analyzed in the development of a trafficability classification scheme. In 1964 data from 238 sites were collected specifically for this study. Other data used were collected in various Mobility Environmental Research Study (MERS) programs including:



a preliminary survey of environmental factors affecting ground mobility in Thailand,<sup>2</sup> performed in 1962; the study of a quantitative method for describing terrain for ground mobility, surface composition,<sup>3</sup> performed in 1964-1965; a study of soil moisture-strength characteristics of selected soils in Thailand,<sup>4</sup> performed in 1963-1965; a study of selected airphoto patterns of terrain features,<sup>5</sup> performed in 1964-1965 by the U. S. Army Cold Regions Research and Engineering Laboratory (CRREL); and tests to develop an analytical model for predicting cross-country vehicle performance,<sup>6</sup> performed in 1965. Most of these data came from the Chiang Mai, Nakhon Sawan, Khon Kaen, Lop Buri, Chanthaburi, and Pran Buri study areas. Analyses were made of cone index, remolding index, rating cone index, surface shear strength, moisture content, density, and specific gravity of soils of low and high topography identified according to the USCS and the USDA textural classification system.

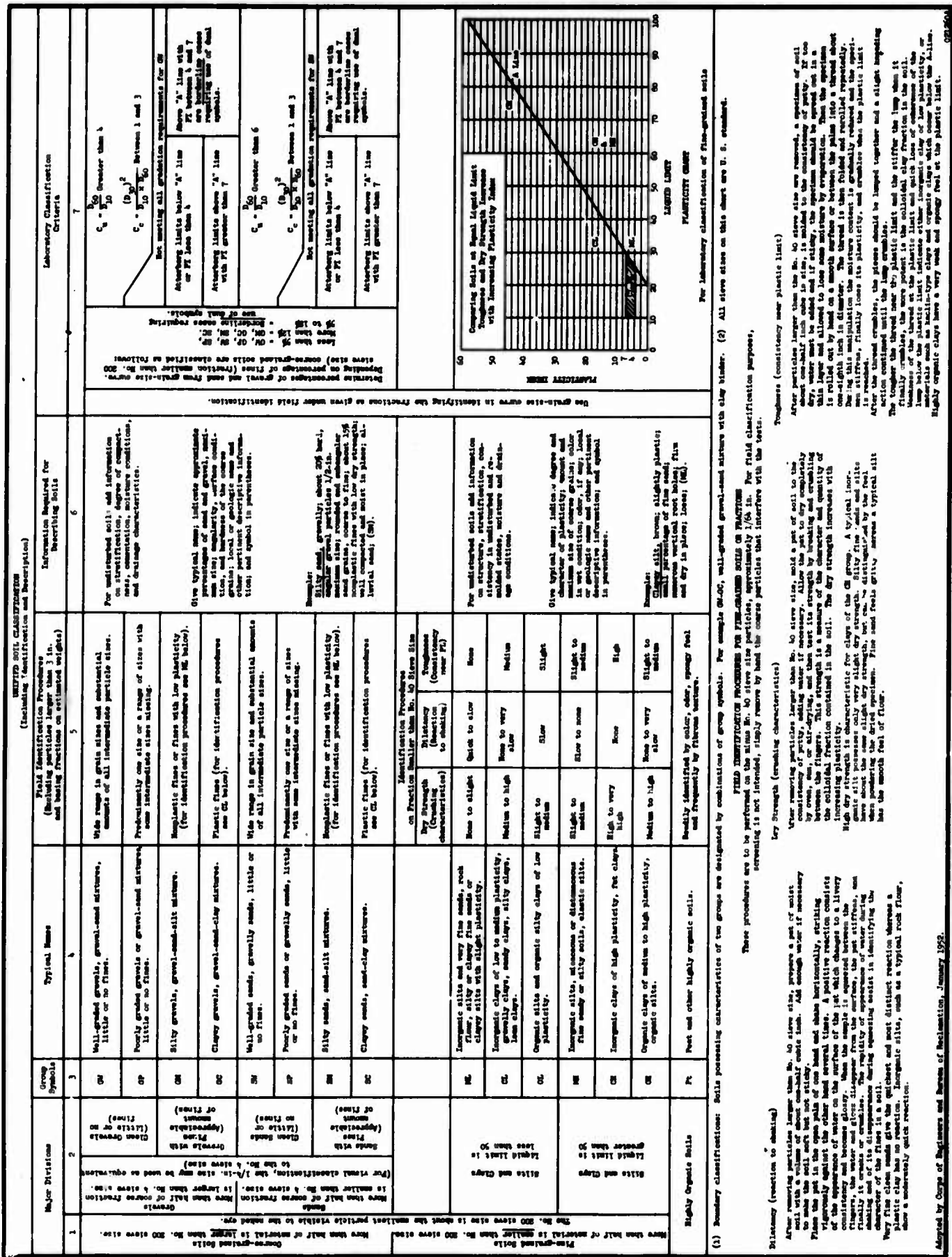
#### General Approach

4. A soil trafficability classification scheme, if it is to be practicable, must first name or identify the soils according to some recognized system of soil classification, then establish trafficability limits for each soil type, and finally, if feasible, collect the various soil types into a small number of groups, each exhibiting a discrete trafficability behavior. The ideal scheme would be one that provides for consideration and evaluation of all aspects of the environment (pedologic, geologic, hydrologic, physiographic, climatic, and vegetative) that affect the trafficability of the soil. The scheme reported herein considers the soil type under very general space and time conditions in a tropical climate. Further refinement according to the environmental characteristics mentioned previously must await the collection of additional data and further analysis.

5. Because their trafficability behavior is not materially affected by moisture content, clean sands and gravel have been given a distinct place in the soil trafficability classification scheme and have been excluded from the various statistical analyses that are presented in this report.

6. The soil trafficability classification scheme presented in this report may be considered a composite classification scheme because it uses two well-known systems of soil identification and is based on two moisture levels. The two soil classification systems used are the USCS<sup>7</sup> (fig. 1) and the USDA soil textural classification system<sup>8</sup> (fig. 2). The USCS employs soil texture, plasticity, and organic content to name or type soils, whereas the USDA system is based solely on grain size distribution. Because the USCS characterizes soils on the basis of their engineering behavior, it is considered to be more applicable to the development of a soil trafficability classification scheme than the USDA system. However, since many areas in Thailand and other areas in Southeast Asia are mapped in USDA terms, it was also considered desirable to develop a scheme in USDA terms.





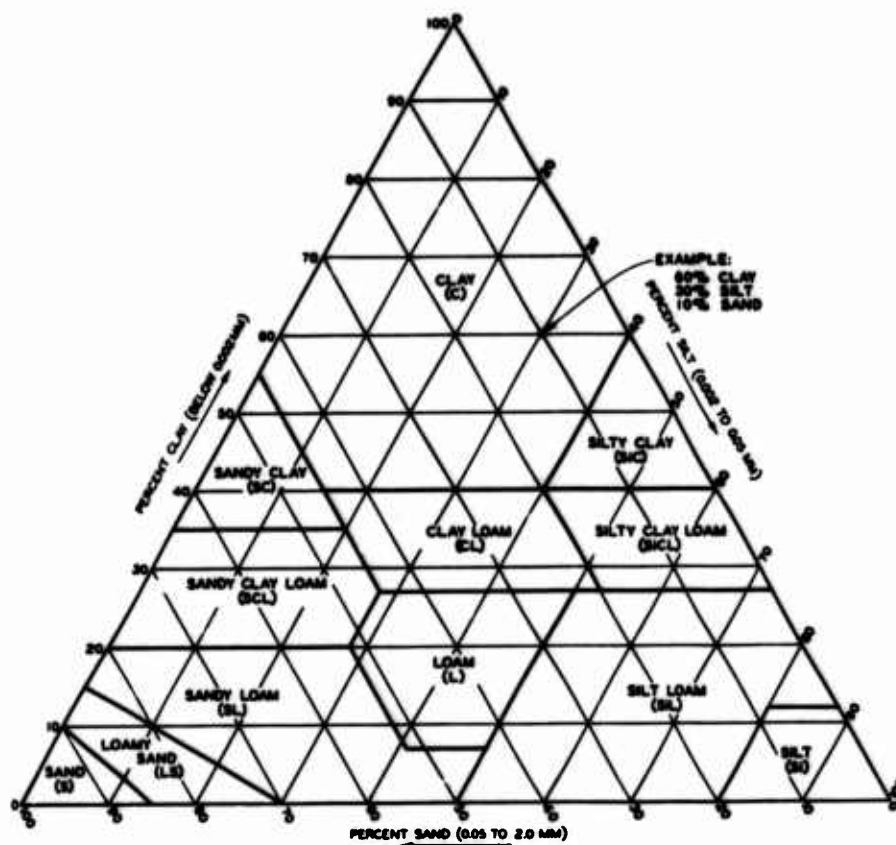


Fig. 2. USDA soil textural classification system

## PART II: TRAFFICABILITY FACTORS

7. Trafficability is defined as the capacity of a soil to withstand traffic by vehicles. It is an important aspect of cross-country movement which may be defined as the ability of terrain to permit the movement of vehicles. The factors that influence cross-country movement are numerous. They include not only the many variables which combine to determine the strength and other physical properties of soils, but also slope and other natural obstacles such as drainageways, scarps, vegetation, and microrelief features, as well as man-made obstacles such as railroad embankments, canals, paddy dikes, etc. The investigation reported herein deals mainly with the trafficability of soils. However, the effects of slope are also considered.

### Soil Bearing and Traction Capacities

8. Bearing and traction capacities are primarily functions of strength (or shearing resistance) of a soil. Bearing capacity is the ability of a soil to support a vehicle without undue sinkage; traction capacity is the ability of a soil to provide sufficient resistance between the propulsion element of a vehicle and the soil for the necessary thrust to move the vehicle forward. The trafficability of a soil is considered adequate for a given vehicle if the soil has sufficient bearing capacity to support the vehicle and sufficient traction capacity to enable the vehicle to develop the forward thrust necessary to overcome its rolling resistance.

### Methods of Measuring and Evaluating Soil Trafficability

9. The soil strength measurements used in the WES system for predicting vehicle performance were used in developing the soil trafficability classification scheme discussed in this report. It has been demonstrated that the effect of soil on the performance of vehicles in terms of "go"\*

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\* In this report "go" means that 50 vehicles can pass in straight-line traffic or one vehicle can execute severe maneuvers without becoming immobilized.

and "no go," slope-climbing ability, drawbar pull, and force required to tow the vehicle can be predicted with reasonable accuracy if the mass and surface soil strengths are not vastly different. If the mass soil strength is high and the surface is wet or consists of a thin, soft soil layer, the vehicle will sink very little, but forward motion may be denied because of loss of traction. Present methods for predicting the performance of vehicles on such soils are not entirely satisfactory. Previous investigations have also shown that the change in strength of a soil which will be developed under vehicular traffic differs significantly for fine-grained and coarse-grained soils; therefore, the measurement and evaluation methods differ somewhat. These differences are discussed in the following paragraphs.

Soil strength measurements used  
for determining trafficability

10. Fine-grained soils and sands with fines, poorly drained. In fine-grained soils and in sands with fines, poorly drained, cone index (CI) and remolding index (RI) measurements are necessary to define soil trafficability. The CI provides an index of the in-situ or undisturbed shear strength of the soil prior to vehicular traffic. It, by itself, is inadequate for predicting the soil strength after repeated traffic by a vehicle because repetitive traffic invariably remolds the soil, thus altering its strength. The probable effect of vehicular traffic on soil strength is obtained from the RI, which indicates the direction and magnitude of the strength change that can be anticipated under vehicular traffic. An RI less than 1.00 denotes a strength loss as a result of remolding; an RI greater than 1.00 indicates a gain in strength. For example, a wet silt may retain only 25% of its undisturbed strength once it is subjected to repetitive vehicular traffic.

11. The trafficability of fine-grained soils and sands with fines, poorly drained, is therefore defined in terms of a value called the rating cone index (RCI), which is the product of the CI and the RI for the same soil layer. In general, the soil layer between the 6- and 12-in. depths is critical for most military vehicles operating in such soils. However, the depth of the critical layer varies with the strength profile of the soil and the vehicle type and weight.<sup>9,10</sup>



12. Various instruments are currently being tested to determine their utility for predicting surface traction for soil trafficability purposes. One instrument (sheargraph) used in this study provides a measure of the ultimate cohesion and ultimate angle of internal friction for soil-to-soil and rubber-to-soil shear failures. In this study a normal load of 10 psi was arbitrarily selected as a constant in determining the surface shear strength of a soil. The equipment and procedures used in taking sheargraph measurements and in reducing and evaluating the data are described in references 11 and 12.

13. Coarse-grained soils. For coarse-grained soils or clean sands, CI measurements alone are adequate to quantify trafficability. Usually, the strength of clean sands is not altered significantly by changes in moisture content. Clean sands possess adequate strength to support vehicles without critical sinkage. In clean sands the first pass is the most critical, and subsequent passes are made with less difficulty. The 0- to 6-in. layer is considered the critical layer for most military vehicles.

Evaluation of soil trafficability

14. Fine-grained soils and sands with fines, poorly drained. The ability of a given vehicle to complete 40 to 50 passes traveling in a straight-line path over a level area or to execute severe maneuvers in fine-grained soils or sands with fines, poorly drained, is assured if the RCI of the soil in the critical layer in that area is equal to or greater than the vehicle cone index (VCI) assigned to that vehicle. In general, an RCI equal to 50% of the VCI indicates sufficient soil strength to permit one or two straight-line passes of the vehicle.<sup>13</sup> If the RCI is greater than the VCI of a given vehicle, the additional traction resulting from the excess soil strength can be used to accelerate the vehicle, negotiate slopes, or tow a load.

15. The VCI's for most military vehicles are tabulated in several publications.<sup>9,10</sup> The referenced publications also contain formulas for computing mobility indexes, means of relating these indexes to VCI's, and the relation of drawbar pull, slope, and force required to tow the vehicle to soil strength.

16. Coarse-grained soils. Studies being conducted on clean sands

have not yet progressed to the point of quantifying trafficability. Results thus far indicate that tracked vehicles usually experience little or no difficulty traversing level, clean-sand areas. The effect of soil strength on vehicle performance (in terms of drawbar pull and slope-climbing ability) of a given tracked vehicle is small; however, a significant difference in performance exists among vehicles having different types of track systems. A wide range in wheeled-vehicle performance occurs as a result of changes in tire pressure, number of tires, and tire size.

#### Soil Moisture

17. The principal factor influencing the strength of a given soil is its moisture content. Any soil in a comparatively dry state may be trafficable to all military vehicles; but at high moisture content, its strength and consequently its trafficability may be such that only certain vehicles can pass. It is apparent that moisture conditions must be taken into account in any evaluation of the trafficability of soils and, further, that soils must be at similar or equivalent conditions of moisture in order that they can be rated fairly in comparison with each other.

18. Moisture is added to the soil through precipitation, a rising water table, flooding, or irrigation. Moisture is generally depleted from the soil by runoff, gravitational percolation, evaporation, or transpiration through plants. The rate and magnitude of moisture gain or loss and the capacity of the soil to hold water are controlled primarily by the soil and by site characteristics that determine the porosity and permeability of the soil. These characteristics, for the most part, are influenced by the plastic, organic, and textural properties of the soil that are defined in terms of the USCS and the USDA soil classification system.

#### Climate and season

19. Climate must be considered in any type of soil-moisture analysis. The principal elements of climate consist of precipitation, temperature, atmospheric humidity and pressure, and wind velocity. Of these, precipitation and temperature are the two most important factors controlling the gain and loss of soil moisture. Similar soils within a specific climatic

area will have qualitatively similar seasonal soil-moisture conditions; and conversely, similar soils of different climates will have dissimilar seasonal soil-moisture regimes. Soils in hot, humid climatic areas, for example, generally approach minimum moisture levels more rapidly than soils in cool, humid climatic areas because of higher rates of evapotranspiration.

20. For purposes of this study, a wet season and a dry season are considered, based on the qualitative moisture conditions of the soil. The wet season is defined as the period of the year when generally high soil-moisture contents prevail; it corresponds to the period of maximum precipitation. The dry season is defined as the period of generally low soil-moisture contents, although maximum moisture contents may occur for short periods immediately after several days of heavy rain.

21. Soil-moisture studies conducted at specific sites in various sections of Thailand for continuous periods of almost two years have been used to refine a system for predicting the effects of meteorological factors on the trafficability of soils. The studies show, among other things, that the top 12 in. or so of soil attain relatively high moisture contents during the monsoon season beginning in May or June and continuing through October or November. The distribution of high-rainfall months wherein the rainfall exceeds 100 mm (3.94 in.) a month is recorded in the following tabulation for nine weather stations in Thailand that are located in areas that include most of the study sites.

Location of Weather Station	Years of Record	Percent of Years of Record with Rainfall Exceeding 100 mm (3.94 in.) per Month											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Chiang Mai	19-1/2	0	0	0	20	80	75	89	100	100	63	11	0
Khon Kaen	17	0	0	12	35	100	76	76	100	100	35	0	0
Nakhon Sawan	15	0	7	0	13	53	53	67	93	100	73	0	0
Lop Buri	17-1/2	0	0	24	29	71	82	94	89	100	61	6	0
Bangkok	23-2/3	0	4	4	35	87	87	79	92	100	96	17	0
Chanthaburi	23	4	9	26	70	100	100	100	100	100	96	26	0
Sattahip (Chanthaburi Area)	23	0	17	17	48	74	26	30	35	87	96	52	4
Hua Hin (Pran Buri Area)	20-1/3	5	0	0	15	55	40	25	40	67	81	43	0
Songkhla (Hat Yai Area)	22-2/3	61	17	22	43	57	57	45	33	55	96	100	91

Space and time factors  
affecting soil-moisture content

22. In order to estimate the trafficability of a site more accurately, consideration must be given not only to its soil type but also to its topographic position and its general relative moisture-content level. From a study of the data available, certain arbitrary "space" and "time" factors have been designated that are considered essential for optimum accuracy in estimating trafficability on the basis of existing knowledge and available data. Additional data and further study may produce more explicit criteria for estimating the trafficability at a site. However, at the present time, two space factors (low and high topography) and two time factors (wet-season and high-moisture conditions) will be used. These are illustrated in fig. 3 and explained in the following paragraphs.

23. Space factors. The depth to the water table has been found to be a significant factor in determining how wet a site may become. Sites which have a water table within 4 ft of the surface become wetter in the top foot than do sites with the water table below the top 4 ft, even though all other conditions appear to be the same.

- a. Low topography. A site of low topography is one at which a water table is known to exist within 4 ft of the surface, perennially or at some time during the year. Such sites usually occur as bottomlands, lower terraces, depressions, or bottoms of slopes, or occasionally as upland flats associated with impervious subsurface layers or pans. They are generally characterized by poor to fair external drainage and moderately poor to very poor internal drainage. If the water table is actually observed at depths of less than 4 ft from the surface at a site at least once, the site automatically qualifies as a low-topography site. If observed data on water-table depth are not available, sites which appear, from observation, likely to have high water tables on the basis of their topographic position, drainage characteristics, proximity to surface water bodies, or soil coloring (gray or blue mottled soils usually indicate the presence of a consistent water table) are judged to be low-topography sites.
- b. High topography. Sites of high topography have water tables at depths greater than 4 ft from the surface at all times. These sites are characterized by soils with no impervious layers or pans and with moderate to good internal and external drainage. They are usually located on ridges or upper



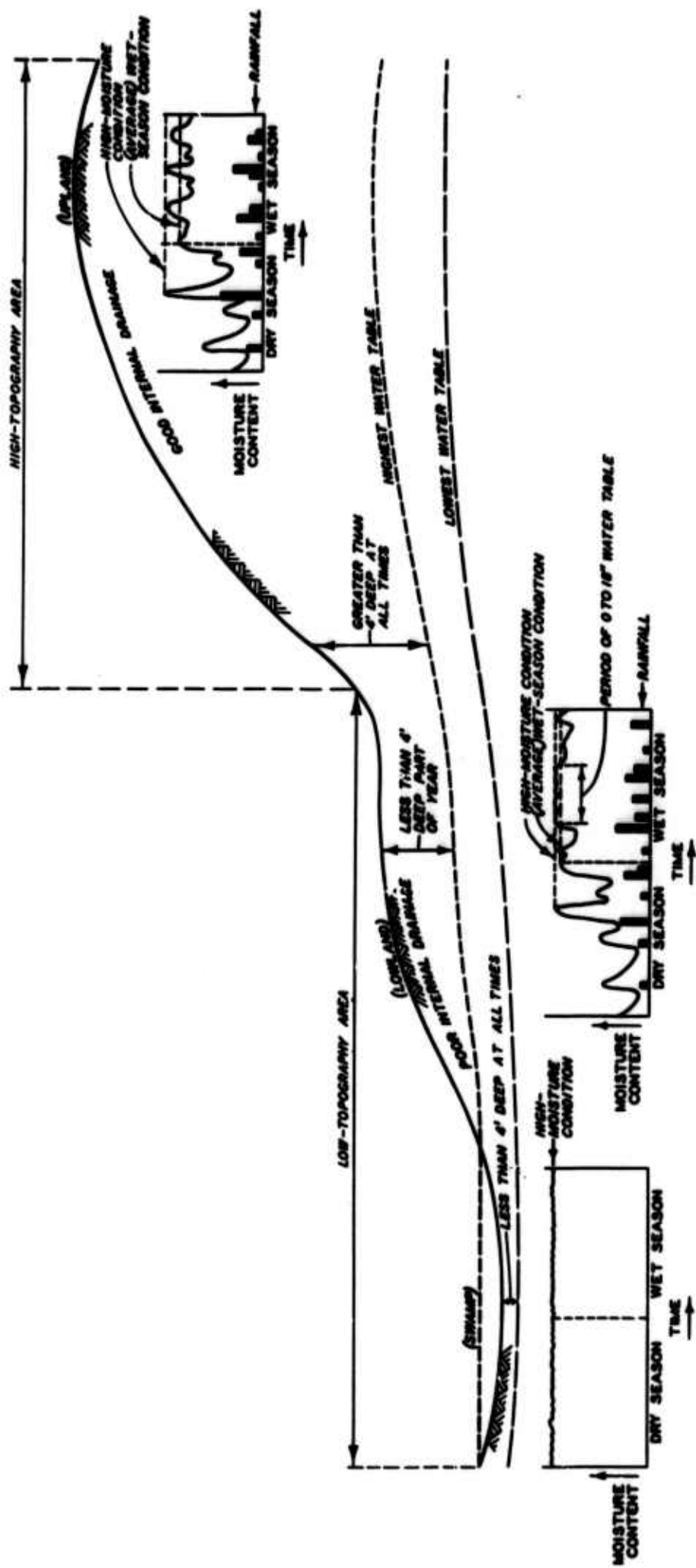


Fig. 3. Profile of a typical area showing various topography-moisture conditions during year

slopes. If information on the water table is not available, it is usually possible to determine whether a site is one of high topography through a study of the topographic position and other environmental data available.

24. Time factors. While for this study it would have been desirable to have examined the means and ranges of pertinent soil values measured at a time when the moisture content was at rigorous reference levels, such as field maximum or field capacity, this was not feasible because only a few sites (the prediction-development sites) were known to have been tested when the moisture content was at these levels. In order to realize the benefit of values derived from large masses of data, less rigorous moisture levels, wet-season and high-moisture conditions, were selected. These conditions, or time factors as they are called in this report, are discussed in the following subparagraphs.

- a. Wet-season condition. The wet-season condition is intended to represent the average moisture condition prevailing in soils during the wet season. Data from some of the drier sites were not utilized because the soil was too firm to obtain the necessary data for a determination of rating cone index. Exclusion of these data tended to bias the averages toward wetter-than-average conditions.
- b. High-moisture condition. The high-moisture condition represents the worst trafficability condition that can occur at sites that undergo seasonal changes. Marshes, bogs, swamps, and other perennially wet, soft, spongy areas are prime examples of low-topography areas under a high-moisture condition at all times. Low-lying areas with fluctuating water tables and upland areas with seasonal perched water tables are typical examples of low-topography areas where a high-moisture condition occurs intermittently. Low- and high-topography areas that have been subjected to moderate or heavy rainfall are normally under a high-moisture condition during and immediately following rain periods. In this study a high-moisture condition at high-topography sites could not be identified from the collected data. Consequently, an analysis was not made for this topography-moisture condition and the classification scheme does not include data for this category. Only one set of high-moisture data (cone index, remolding index, rating cone index, sheargraph, and moisture content) was used in the analysis for a given low-topography site. At sites where high-moisture data were collected on more than one day, the set of data selected was for the day of lowest rating cone index. The moisture content for this day was usually, but not

necessarily, the highest recorded at the site. In analyzing the data, a high-moisture condition was considered to have been prevalent at a low-topography site when it was known that the water table was within the top 18 in. of soil. (This 18-in. criterion is based on studies in the United States<sup>14</sup> that show that the strength of a soil decreases at a logarithmic rate with a decrease in depth to the water table and a relatively small rate of change of strength per unit change in depth to the water table when the water table is above a depth of 18 in.)

### Slope

25. Vehicles that can traverse certain soils on level surfaces often become immobilized when climbing slopes on similar soils. These immobilizations can be attributed primarily to a downhill force, a function of the vehicle's weight and the angle of slope, which opposes the vehicle's forward thrust. In this report slope is expressed in terms of percent (vertical rise divided by horizontal distance, multiplied by 100).

#### Slope index

26. The adverse effect of slope on vehicle performance can be expressed by an increase in rating cone index requirements above the vehicle's requirements for level terrain. These excess RCI points, called slope index, may be added to the vehicle cone index and the determination of "go" or "no go" is made by comparing this value with the measured RCI. Detailed procedures are available for determining slope effects and for estimating the maximum slopes negotiable by various vehicle types.<sup>9,10</sup> Three slope index values, one for tracked vehicles with grousers longer than 1-1/2 in., another for tracked vehicles with grousers shorter than 1-1/2 in., and the third for wheeled vehicles, can be obtained for a given slope from the three respective curves shown in plate 1. If, for example, the slope is 30%, the slope indexes for the three vehicle classes would be 13, 15, and 20, respectively.

#### Effective rating cone index (ERCI)

27. The ERCI is a combined soil strength-slope value which rates the trafficability of a sloping soil. The index is computed by subtracting the slope index from the rating cone index. For example, if the RCI of a soil

is determined to be 50 and the slope is 30%, the ERCI would be 37 (50 minus 13) for tracked vehicles with grousers longer than 1-1/2 in.; 35 (50 minus 15) for tracked vehicles with grousers shorter than 1-1/2 in.; and 30 (50 minus 20) for wheeled vehicles. The determination of "go" or "no go" on sloping terrain is based on a comparison of the vehicle cone index with the ERCI for the vehicle class. If the VCI is greater than the ERCI, vehicles of this type will not be able to climb the slope; if the VCI is less than the ERCI, the slope is considered negotiable. The ERCI can also be applied and, if desired, mapped in regard to level terrain. In this case, the slope index is zero for all vehicle classes and the ERCI is equal to the RCI of the soil.



### PART III: ANALYSIS OF DATA

28. The data were classified and analyzed in terms of both USCS and USDA soil types under a high-topography, wet-season condition, a low-topography, wet-season condition, and a low-topography, high-moisture condition. The following studies were conducted:

- a. A determination of means and standard deviations of cone index, remolding index, rating cone index, moisture content, dry density, and specific gravity for the 6- to 12-in. soil layer; cone index and moisture content for the 0- to 6-in. soil layer; and sheargraph shear strength for surface soils.
- b. A cumulative frequency analysis of rating cone index for the 6- to 12-in. soil layer for each USCS and USDA soil type and for all soils.

#### Basic Data

29. The data used in these analyses were obtained from 846 sites, 701 of which were located in six MERS study areas, including 103 sites in Chiang Mai, 117 in Khon Kaen, 77 in Nakhon Sawan, 160 in Lop Buri, 182 in Chanthaburi, and 62 in Pran Buri. The remainder of the test sites were located in other sections of Thailand. The general locations of the sites are shown in fig. 4. The data were derived from six different test programs conducted for MERS during the period June 1962 through October 1965. The number of sites from each program which provided data for this study and for each analysis is shown in the following tabulation. The procedures

	<u>Preliminary Survey</u>	<u>Traffic- ability Classi- fication</u>	<u>Sur- face Compo- sition</u>	<u>Soil Moisture- Strength</u>	<u>CRREL Air- photo Pattern</u>	<u>Terrain- Vehicle Tests</u>	<u>Total</u>
Number of sites	165	238	224	75	121	23	846
Mean and standard deviation							
Wet-season condition							
CI, 0-6 in.	160	238	224	75	105	23	825
CI, 6-12 in.	157	238	224	75	105	23	822
RI and RCI,* 6-12 in.	91	193	146	70	69	14	583
Sheargraph shear strength	--	227	197	50	--	22	496
Moisture content, 0-6 in.	145	238	106	75	105	22	691
Moisture content, 6-12 in.	130	238	105	75	104	20	672
Dry density, 6-12 in.	116	193	29	75	--	10	423

(Continued)

\* Also used in analysis of cumulative frequency.

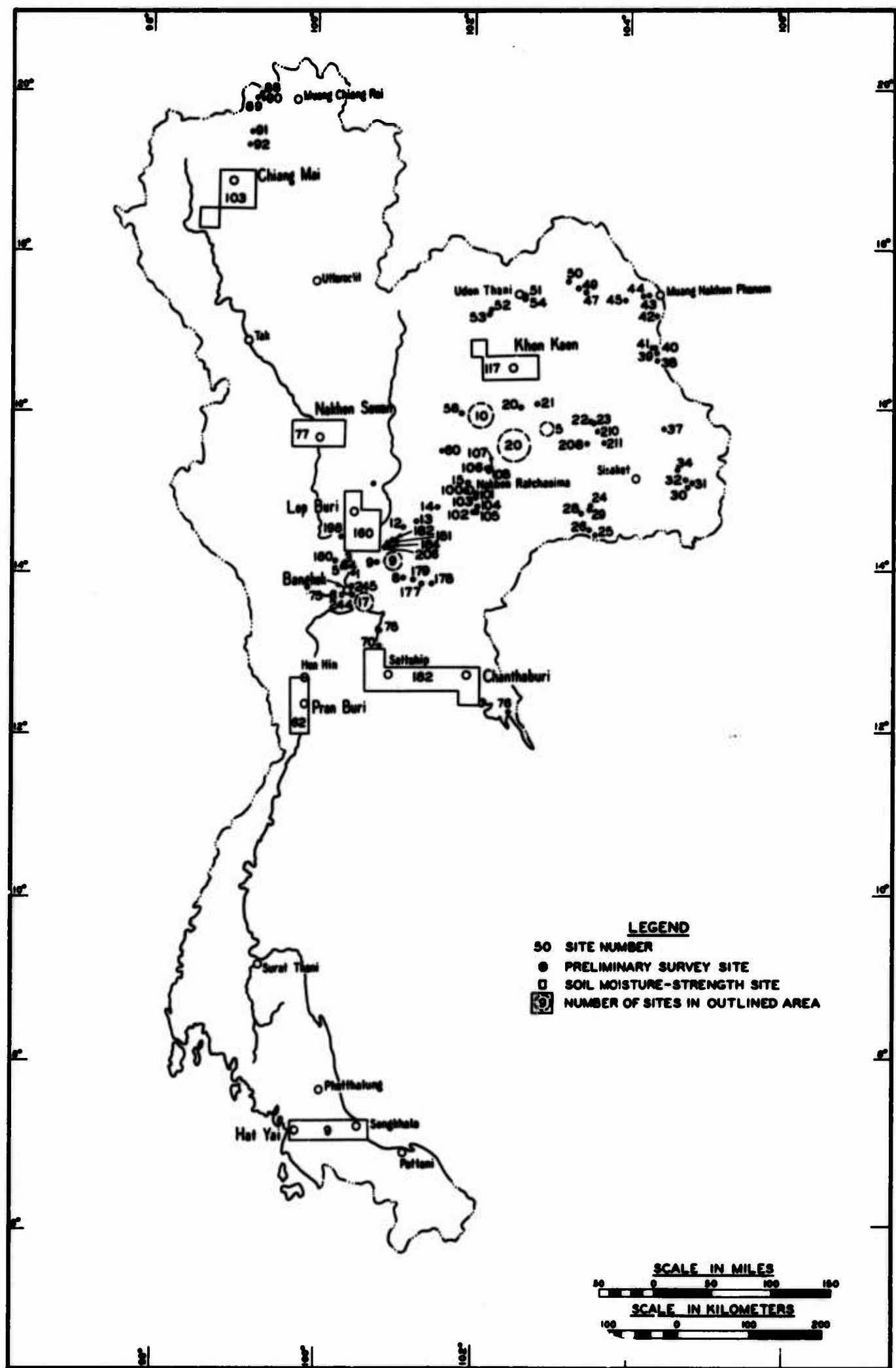


Fig. 4. General location of study sites

	<u>Preliminary Survey</u>	<u>Traffic- ability Classi- fication</u>	<u>Sur- face Compo- sition</u>	<u>Soil Moisture- Strength</u>	<u>CRREL Air- photo Pattern</u>	<u>Terrain- Vehicle Tests</u>	<u>Total</u>
Number of sites	165	238	224	75	121	23	816
Mean and standard deviation							
High-moisture condition							
CI, 0-6 in.	70	72	64	40	7	15	268
CI, 6-12 in.	69	72	63	40	7	15	266
RI and RCI,* 6-12 in.	55	67	49	38	7	14	230
Sheargraph shear strength	--	43	30	4	--	15	92
Moisture content, 0-6 in.	63	72	50	40	--	15	240
Moisture content, 6-12 in.	61	72	50	40	--	14	237

\* Also used in analysis of cumulative frequency.

used in obtaining data in each program are discussed in Appendix A; the data are presented in tables A1-A6.

#### Method of Computation

30. The General Electric 225 electronic digital computer was employed in computations for this study. Two computer programs were required, one to compute the mean and standard deviation values and one to determine the frequency of occurrence of rating cone index. Data for these programs were supplied to the computer by means of punched IBM cards. These cards form a data retrieval system containing for each site the characteristics of the site (e.g. geographic location, topography class, topographic position, slope, land use, vegetation, etc.), soil data (e.g. percent grain sizes, Atterberg limits, USCS and USDA soil type, specific gravity, organic content, etc.), trafficability data (including CI, RI, RCI, sheargraph measurements, moisture content, and density for wet-season and high-moisture conditions, etc.), and climatological data (e.g. longtime average annual rainfall and temperature, etc.). For a given site, eight IBM cards are required to store approximately 125 pieces of information describing the site, soil, trafficability conditions, and climate.

#### Mean and Standard Deviation Values of Soil Properties

31. This study establishes the statistical mean and standard deviation values of cone index and moisture content for the 0- to 6- and

6- to 12-in. soil layers; remolding index, rating cone index, dry density, and specific gravity for the 6- to 12-in. soil layer; and sheargraph shear strength for the surface soil. Values for the dynamic soil properties, including moisture content, cone index, remolding index, rating cone index, and sheargraph shear strength, were computed for each of the three topography-moisture condition categories. Values for the static soil properties, including density and specific gravity, were computed only for a wet-season condition (high and low topography, respectively). Data are presented for each of the soil types in the USCS and USDA system in tables 1-7. The mean values in each table, except those for moisture content (table 5), are arranged from top to bottom in decreasing order; the moisture contents are arranged in increasing order. Where data are presented for both the 0- to 6- and 6- to 12-in. layers (tables 1 and 5), the soil types are arranged in order of mean values of the 6- to 12-in. layer. Where data are presented for soil-to-soil shear and soil-to-rubber shear (table 4), the soil types are arranged in order of mean values of soil-to-soil shear.

32. The data were analyzed in terms of mean ( $\bar{x}$ ) and standard deviation ( $s$ ) because these are probably the most widely used and most readily understood statistical measures. The mean (commonly termed arithmetic mean or average) is computed by summing the individual measurements and dividing by the total number of measurements. The standard deviation is a measure of the dispersion of the data around the mean. The standard deviation for less than 30 measurements was computed by means of the formula

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

where

$\Sigma$  = the sum of

$(x - \bar{x})$  = the deviation of an individual measurement from the mean of all measurements

$n$  = the number of measurements

The -1 was omitted from the denominator of the formula when 30 or more



measurements were used in the computation. When the number of measurements for the specific condition exceeds 30, the interval defined by  $+1$  and  $-1$  standard deviation from the mean will usually contain approximately 68% of the data. Assuming the data are universally valid, if three additional measurements were taken, the values of two would usually fall within this interval. Mean and standard deviation values of a condition with fewer than 30 measurements, and especially of a condition with fewer than 5 measurements, should be viewed with skepticism.

33. The data in table 5 show that mean moisture contents for a given soil type are generally highest under a low-topography, high-moisture condition, intermediate under a low-topography, wet-season condition, and lowest under a high-topography, wet-season condition. If data had been developed for a high-topography, high-moisture condition, the mean moisture content would probably lie between those for the low-topography, wet-season condition, and the low-topography, high-moisture condition. This consistent pattern for all soil types (except a few with mean values that are based on relatively few observations and are therefore questionable) is presumed to be evidence in support of the proper identification of site data into the three arbitrary space-time categories used in this report.

#### Analysis of strength

34. Cone index. The results of the analysis of CI are given in table 1. The data show mean cone indexes that are generally highest for the USCS coarse-grained soils with fines and USDA gravelly and sandy soils, intermediate for the USCS fine-grained soils and USDA loamy soils, and lowest for the USCS organic soil (OH) and USDA silty and clayey soils. Exceptions are the USCS low-plasticity soils (CL-ML and ML) of the 6- to 12-in. layer which have the highest mean cone indexes of all soils under low-topography, wet-season and high-moisture conditions. (The maximum mean value, for GC, is based on one sample and, therefore, is not reliable.) The data also show higher cone indexes for the 6- to 12-in. soil layer than for the 0- to 6-in. layer; the mean cone indexes for all soils under each of the three topography-wetness conditions range from 57 to 78 units higher in the 6- to 12-in. layer than in the 0- to 6-in. layer.

35. The mean and standard deviation values for each of the soil

types and for all soils of a wetness condition are higher than those reported for temperate climates.<sup>1</sup> This apparent difference can be accounted for by differences in the procedures used in the two studies for measuring cone index. In the temperate-soil study, the capacity of the cone penetrometer was 300 (0.5-in. cone), whereas in this study the capacity of the instrument was extended to 750 (0.2-in. cone) in order to satisfy the needs for soil strength data for other engineering purposes. The average cone index for firm soil is higher when measured with the 0.2-in. cone. For example, the soil tested with the 0.5-in. cone may give several 300+ readings, whereas the same soil tested with the 0.2-in. cone may give readings of 420, 480, etc.

36. Remolding index. The results of the analysis of RI are given in table 2. A comparison of the mean RI's for all soils shows lower average RI's for the low-topography positions. The data show an average RI of 1.03 for soils under high-topography, wet-season condition, an average RI of 0.76 for soils under low-topography, wet-season condition, and an average RI of 0.66 for soils under low-topography, high-moisture condition. Under each topography-moisture condition, the mean remolding indexes are generally highest for the USCS silty, coarse-grained and highly plastic, fine-grained soils and USDA sandy soils, lowest for the USCS low-plasticity, fine-grained soils and USDA loamy soils, and intermediate for the remaining soils. For the moisture levels considered in this report, relatively few soil types have mean RI's greater than 1.0.

37. Rating cone index. The results of the analysis of RCI are given in table 3. Like those for cone index, the data generally show rating cone indexes that are highest for the USCS coarse-grained soils with fines and USDA sandy soils, intermediate for the fine-grained soils, and lowest for the USCS organic soil (OH). The mean RCI for all soils under wet-season condition is about 60 units higher for high-topography than for low-topography position (i.e. 180 versus 121 RCI), and the mean RCI for low-topography position is 35 units higher under the wet-season condition than under the high-moisture condition (i.e. 121 versus 86 RCI). Because of test procedures that provide higher cone indexes in this study, the rating cone indexes are higher and the means and standard deviations are

appreciably greater than those for comparable soils in a temperate climate (see paragraph 35 for an explanation).

38. Sheargraph shear strength. The results of the analysis of sheargraph shear strength of the surface soil for a normal load of 10 psi are given in table 4. The soil types are those for the 0- to 6-in. layer. A comparison of the mean values for a given topography-moisture condition shows little difference between most soil types. The mean shear strengths for soil-to-soil and soil-to-rubber shear appear to be the highest for the high-plasticity and lowest for the low-plasticity USCS soils. A comparison of the mean values for all soils shows a decrease in strength with an increase in the moisture level of the soil for soil-to-soil shear. Only a slight decrease in strength is associated with an increase in moisture level for soil-to-rubber shear. Because the number of samples for most soil types was insufficient for proper statistical analysis, and because the soil type of the 0- to 6-in. layer may, in some cases, be different from that of the surface soil, the results and conclusions drawn from this analysis should be viewed with caution.

#### Analysis of moisture content

39. The results of the analysis of moisture content are given in table 5. The moisture content is inversely proportional to the soil strength. The data show mean moisture contents to be lowest for the USCS coarse-grained soils with fines and USDA gravelly and sandy soils, intermediate for the USCS low-plasticity, fine-grained soils and USDA loamy soils, and highest for the USCS high-plasticity and organic soils and USDA clayey soils. The mean moisture contents for all soils of the 0- to 6- and 6- to 12-in. layers are about 5% higher for low-topography than for high-topography, wet-season condition and those for low-topography position are about 4% higher for high-moisture than for wet-season condition. Also, mean moisture contents of all soils are about 2% higher for the 0- to 6-in. layer than for the 6- to 12-in. layer.

#### Analysis of dry density

40. The results of the analysis of dry density are given in table 6. Experience has indicated that changes in dry density of surface soils do not significantly affect their trafficability properties. However, the



density data, along with specific gravity and moisture content data, can be used to estimate the percent saturation of a soil, which is an indicator of the degree of wetness. In this study the density data were analyzed for high- and low-topography, wet-season conditions. The data show densities that are generally highest for the USCS coarse-grained soils with fines and low-plasticity, fine-grained soils and USDA gravelly and sandy soils, intermediate for the USCS moderately plastic, fine-grained soils and USDA loamy soils, and lowest for the USCS highly plastic and organic soils and USDA clayey soils. The mean density for all soils is about 2 lb per cu ft higher under a high-topography condition than under a low-topography, wet-season condition. A comparison of individual USCS soil types shows the density of all soils except CL and SM to be higher for the high-topography position than for the low-topography position. The CL and SM soil densities are slightly less in high positions than they are in low positions.

#### Analysis of specific gravity

41. The results of the analyses of specific gravity are given in table 7. The specific gravity is a static soil property that does not vary with moisture content; consequently, the data were analyzed only for a wet-season condition. The mean specific gravity for all soils of high topography is 0.04 higher than that for all soils of low topography. Specific gravities are highest for the USCS plastic soils and USDA gravelly and clayey soils, and lowest for the USCS low-plasticity and organic soils and USDA silty and sandy soils.

#### Cumulative Frequency Analysis of Rating Cone Index

##### Procedures and presentation of data

42. The data used in this analysis are the same that were used in the mean and standard deviation analyses of RCI under wet-season and high-moisture conditions, respectively. The only difference between this and the previous analysis is in the statistical treatment of the data.

43. RCI's for each soil type under each topography-moisture condition were grouped into intervals of 10 RCI's from 1 to 300 and 300+, i.e. 1 to 10, 11 to 20, 21 to 30...291 to 300, and 300+. The measurements in



each class for the group of 300+ observations were tallied and their percentage of the total number was computed. The percentages were added cumulatively, starting with the percentage of 300+ observations and progressing in order of decreasing RCI. Thus, the 300+ or the larger value of the highest RCI increment for which data were available always was 0% frequency, and the smaller value for the lowest RCI increment for which data were available was 100% frequency. The RCI at 50% frequency is the median value.

44. The data are plotted in cumulative frequency graphs in plates 2-5 for the USCS soil types and in plates 6-9 for the USDA soil types. Graphs for three moisture conditions are usually shown for each soil type. Data were not available for sandy clay (USDA type) and OL and Pt (USCS types), nor were data available for analysis of one or more of the wetness conditions in some of the other soil types. The number of samples (sites) used in each analysis is indicated on its graph.

45. It is noted that where an appreciable number of samples were available for analysis, the three curves drawn for each soil type seldom cross each other. Also, the general range of RCI increases from the high-moisture graph through that for low-topography, wet-season, to the high-topography, wet-season graph. This is taken to be evidence of proper categorization of the basic field data into the three general moisture conditions.

46. Graphs are used to show the manner in which RCI varied. For example, the solid-line curve for CL soils in plate 4 shows that 10% of the CL soils under a low-topography, high-moisture condition had RCI's greater than 127, 20% had values greater than 100, and 30% had values greater than 90, etc.

Estimating probability of vehicle "go"

47. The graphs can be used for estimating the probability of "go" for military vehicles. A soil for which the RCI is greater than the VCI will permit 50 vehicles to pass in straight-line echelon or one vehicle to execute severe maneuvers. Thus, the cumulative frequency corresponding to the VCI indicates the probability of a vehicle's success in a given

soil type under a given general moisture condition. For example, if it is known that the soil type is CL and that the water table is within 18 in. of the surface so that the soil is under a low-topography, high-moisture condition (but specific data on strength cannot be obtained), it can be hypothesized from plate 4 that the M48 tank (VCI = 49) would have a 76% probability of "go."

Analysis for all soils

48. An analysis was made of the cumulative frequency of RCI for all soils under wet-season and high-moisture conditions. The procedures of analysis were the same as those used in the analysis of each soil type (see paragraph 43). The curves developed from the analysis may be used to estimate the percentage of areas trafficable for a given vehicle under a given condition of moisture. A discussion of the curves and their use is presented in paragraph 73.

#### PART IV: SOIL TRAFFICABILITY CLASSIFICATION SCHEME AND RELATED STUDIES

49. The soil trafficability classification scheme shown in tables 8 and 9 is essentially a listing of soil types in descending order of their median rating cone indexes under three conditions of moisture: high and low topography under wet-season conditions, and low topography under a high-moisture condition. Information for a high-topography, high-moisture condition was not included in the scheme because data were too few to permit proper analysis. Soil types according to both the USCS and the USDA soil classification system are employed. Thus the scheme can be considered a sixfold scheme for the classification of soils from a trafficability standpoint. The scheme considers the strength of soils in the 6- to 12-in. layer.

50. This part of the report summarizes the vehicle classification categories developed in an earlier study, and describes the soil trafficability classification scheme and its possible application in detail. Tables 10 and 11 supplement the classification scheme by providing specific data on the percent probability of "go" for military vehicles on level and sloping terrain for each of the three general moisture conditions and the two soil classification systems.

##### Vehicle Categories

51. Different military vehicles require different minimum soil strengths for operation. A soil condition that is easily trafficable for one vehicle may be impassable for another. Therefore, in order to make the soil trafficability classification meaningful, it was necessary to incorporate vehicle requirements into the scheme for estimating the probability of vehicle "go."

52. In an earlier study<sup>15</sup> a system was developed for classifying vehicles on the basis of the minimum soil strength each required for 50 straight-line passes or one severe maneuver on level ground. This system is condensed and repeated here.

<u>Cate- gory</u>	<u>VCI Range</u>	<u>Vehicle and Vehicle Types</u>
1	20-29	M29C weasel, M76 otter, Canadian snowmobile, and some lightweight experimental vehicles. Example: VCI of M29C weasel = 25
2	30-49	Engineer and high-speed tractors with comparatively wide tracks and low contact pressures. Examples: VCI of D7 engineer tractor = 40; VCI of M114 armored personnel carrier = 37
3	50-59	Tractors with average contact pressures, tanks with comparatively low contact pressures, and some trailed vehicles with very low contact pressures. Example: VCI of M48 medium tank = 52
4	60-69	Most medium tanks, tractors with high contact pressures, and all-wheel-drive trucks and trailed vehicles with low contact pressures. Example: VCI of M135, 2-1/2-ton truck = 62.
5	70-79	Most all-wheel-drive trucks, a great number of trailed vehicles, and heavy tanks. Example: VCI of 1-1/2-ton, 4x4 dump truck = 73
6	80-99	A great number of all-wheel-drive and rear-wheel-drive trucks, and trailed vehicles intended primarily for highway use. Example: VCI of 1/2-ton, 4x2 pickup truck = 88
7	100 or greater	Rear-wheel-drive vehicles and others that generally are not expected to operate off roads, especially in wet soils. Example: VCI of 5-ton, 4x2 dump truck = 119

The vehicle cone indexes for individual vehicles within the categories are included in Appendix A of reference 15.

#### Soil Trafficability Classification Scheme, Level Terrain

53. The soil trafficability classification scheme for level terrain is presented in USCS terms in table 8 for high and low topography under wet-season conditions, and for low topography under a high-moisture condition. The scheme is presented in USDA terms in table 9 for the same set of moisture conditions. Information presented in the scheme for each soil type includes a general estimate of the probability of "go" on level terrain for vehicles of various categories. Measurements of soil strength are also included.



### Classification of vehicle "go"

54. For the sake of simplicity of presentation, the percent probabilities of vehicle "go" have been arbitrarily classified as follows:

Excellent	greater than 90% probability of "go"
Good	76 to 90% probability of "go"
Fair	50 to 75% probability of "go"
Poor	10 to 49% probability of "go"
No "go"	less than 10% probability of "go"

The probability-of-"go" information is illustrated in tables 8 and 9 by a series of bar graphs, one for each soil type.

### Procedures for deriving "go" information

55. The vehicle cone indexes corresponding to 10, 50, 75, and 90% probability of "go," the limiting values of the vehicle "go" groupings, were derived from the cumulative frequency rating cone index graphs (plates 2-9). For example, from the CL soil graph for a low-topography, high-moisture condition (plate 4) it can be seen that the RCI's at 10, 50, 75, and 90% cumulative frequency are 128, 74, 50, and 39, respectively. This means that the soil strength will be greater than 128 RCI 10 times out of 100, greater than 74 RCI 50 times out of 100, greater than 50 RCI 75 times out of 100, and greater than 39 RCI 90 times out of 100. Table 8 shows that vehicles with a VCI greater than 128 will have less than a 10% probability of "go"; those with a VCI ranging from 74 to 128 will have 50% probability of "go"; those with a VCI ranging from 50 to 74 will have a 50 to 75% probability of "go"; those with a VCI ranging from 39 to 50 will have a 76 to 90% probability of "go"; and those with a VCI less than 39 will have greater than 90% probability of "go."

### Reliability of "go" information

56. The probability lines delineating the vehicle "go" groupings on the bar graphs in tables 8 and 9 are solid where the data were based on more than four samples and the information shown was considered to be reliable. The lines are broken where less than five samples were used in the analysis or the data were otherwise questionable. The positioning of these

broken lines was based on an assumed RCI estimated from the textural, plasticity, and organic properties of the soil.

57. It should be noted particularly that the occurrence of obstacles was not considered in the probability of "go" estimates for level or sloping terrain. Obstacle components of terrain, such as trees, hedges, dikes, and streams, that present a definite deterrent or obstruction to mobility of vehicles would certainly decrease the probability of "go."

#### Soil strength information

58. The mean CI, RI, surface sheargraph shear strength for a load of 10 psi, and RCI, and the range of RCI (discussed in Part III) are presented again in tables 8 and 9. It may be noted that the mean RCI for a soil generally is greater than its median RCI, which is the same value as the VCI at 50% probability of "go."

#### Probability of Vehicle "Go" on Level and Sloping Terrain

59. The percent probabilities of vehicle "go" on level and sloping soils classified in terms of the USCS are presented in table 10 for both high and low topography under wet-season conditions, and for low topography under a high-moisture condition; these data on soils classified in terms of the USDA system are presented in table 11. The data for each soil type-moisture condition include the probabilities of negotiation of level terrain (0% slope) and slopes of 15, 30, and 45% by vehicles in each of the seven vehicle categories. The probabilities were established for the median VCI within vehicle categories 1 through 6 (i.e. 25 VCI for category 1, 40 VCI for category 2, etc.) and for the minimum VCI (100) in category 7, for tracked vehicles with grousers shorter than 1-1/2 in. and for wheeled vehicles. Tracked vehicles with grousers longer than 1-1/2 in. would have a slightly better probability of "go" on sloping soils than that computed for tracked vehicles with shorter grousers. For all practical purposes, however, the difference is insignificant, and the probabilities of "go" listed under the "tracked" column in tables 10 and 11 may be applied to both types of tracked vehicles. The probability of "go" established for a vehicle with a median VCI of a category will closely approximate and may

be used to estimate the probabilities of "go" for other vehicles within the same category.

Procedure for deriving "go" information

60. The probability data were obtained from the cumulative frequency rating cone index graphs presented in plates 2-9. If VCI is substituted for RCI and probability of "go" for cumulative frequency, an estimate of the probability of "go" on level terrain can be made for any vehicle for which a VCI has been computed (discussed in paragraph 47). In order to determine the probability of "go" for a given slope, the slope index, derived from the curve of the vehicle type shown in plate 1, was added to the VCI and the probability of "go" for the soil type-moisture condition was based upon the cumulative frequency reading for this new VCI value. For example, the probabilities of "go" for tracked and wheeled vehicles of 55 VCI (median VCI of category 3) on 0, 15, 30, and 45% slopes of a silt loam soil area under low-topography, wet-season condition were derived as follows. The VCI was substituted for RCI in the abscissa, and the probability of "go" was substituted for cumulative frequency in the ordinate of the silt loam low-topography, wet-season condition graph shown in plate 8. At 55 VCI the probability of "go," read from the graph, was 87%. This value applies to tracked and wheeled vehicles at 0% slope. The slope index at 15% slope, read from the curves of plate 1, was 7 for tracked vehicles with grousers shorter than 1-1/2 in. and 9 for wheeled vehicles. This index was added to the VCI to provide values of 62 (55 plus 7) for the tracked vehicles and 64 (55 plus 9) for the wheeled vehicles. The probabilities of "go" for the VCI values of 62 and 64, read from the graph in plate 8 for silt loam, low topography, and the wet season, were 80 and 79%, respectively. At 30% slope, the slope indexes were 15 and 20, the VCI's became 70 and 75, and the resulting probabilities of "go" were 74 and 68% for the two vehicle types, respectively; at 45% slope, the slope indexes were 27 and 40, the VCI's became 82 and 95, and the probabilities of "go" read from the graph were 60 and 49%, respectively. The probability of "go" can be estimated for any slope and for any vehicle for which a VCI has been computed by using data read from the proper soil type-moisture condition graph and

slope index curve, and following the procedures discussed above.

#### Reliability of "go" information

61. The probability values for a wet-season condition are undoubtedly influenced by the high-moisture, low-strength bias associated with the basic data (previously discussed in paragraph 24a); thus, the actual probability of "go" would be somewhat higher than that indicated.

62. The number of samples used in the analysis of a particular soil type-moisture condition provides a rough estimate of its reliability. Analyses based on more than 30 samples would generally have a small plus and minus probability error, i.e. the true probability based on an infinite number of the same type of samples would not vary by more than plus or minus a small standard error of estimate. The probabilities of "go," therefore, are considered to be of good reliability. An analysis based on fewer than 30 samples and especially fewer than 15 samples, but more than 4 samples, would have a moderate standard error of estimate (estimated at  $\pm 10$  to  $\pm 25\%$  probability of "go"). Probabilities based on an analysis of this number of samples are considered to be of only fair reliability and should be viewed with skepticism. Five was arbitrarily chosen as the minimum number of samples needed to provide a reasonably reliable probability value; probabilities of "go" were only estimated for the analyses based on fewer than 5 samples. The estimations were based on assumed strengths estimated from the textural, plasticity, and organic properties of the soil.

#### Application of Information for Estimating Trafficability Conditions

63. The information presented in the trafficability classification scheme and probability of "go" tables should be especially useful in military intelligence, military-operations planning, and vehicle-design work. The information may be applied in quantitative or qualitative terms to military problems or to studies of a tactical or strategic nature.

64. The information can be used to estimate trafficability conditions for areas in Southeast Asia that, in most cases, will not be accessible for measurement. Information needed for proper analysis includes



climate and weather, topographic position or water-table conditions, and soil type. Climatological and weather data can be obtained from meteorological records; data on topographic position (and slope if desired) are available from large-scale topographic maps, and information on soil type can be obtained from engineering or pedological reports. It may be reasoned that trafficability-prediction information would not be needed for accessible areas because direct strength measurements with the cone penetrometer could be taken where and when desired. The information, however, could be used in these areas to facilitate a particular study, e.g. the speedy selection of one of several possible access routes, the selection of possible barrier areas (mine fields, etc.) that normally would have good to excellent probabilities of "go," or the selection of broad areas providing the best positions for offensive or defensive operations.

Use of trafficability  
classification scheme

65. The following paragraphs explain by means of examples how the classification scheme can be used.

66. Season, soil type, and topography. If it is known that the season is the wet season, the soil type is CL, and the topography is low topography, the data in table 8 for low-topography, wet-season condition would be used to determine trafficability. In this case, the probability of "go" on the CL soil would be less than 10% for vehicles with VCI's greater than 185, between 10 and 50% for vehicles with VCI's between 89 and 185, between 50 and 75% for vehicles with VCI's between 58 and 89, between 76 and 90% for vehicles with VCI's between 42 and 58, and greater than 90% for vehicles with VCI's less than 42.

67. Season, soil type, topography, plus rainy weather or high-water-table condition. If, in addition to the knowledge of the season, soil type, and topography, it is known that the soil has been subjected to several days of rain, or if a high water table is known to exist, the low-topography, high-moisture condition data presented in table 8 (or table 9 for USDA soils) would be used. The probability of vehicle "go" on CL soils under these conditions would be less than 10% for vehicles with VCI's greater than 128, between 10 and 50% for vehicles with VCI's between 74 and

128, between 50 and 75% for vehicles with VCI's between 50 and 74, between 76 and 90% for vehicles with VCI's between 39 and 50, and greater than 90% for vehicles with VCI's less than 39.

68. Probability of one straight-line pass for a vehicle. For clayey soils, an RCI equal to about 50% of the VCI usually will permit one straight-line pass of the vehicle.<sup>13</sup> The probability of a successful operation may be derived from the classification scheme (tables 8 and 9) by projecting a line down from the VCI value multiplied by one-half and reading the probability at its intersection with the particular graph of soil type-wetness condition under consideration. For example, a vehicle with a VCI of 100 would have a recomputed index of 50 ( $100 \times 0.50$ ). The probability of its making one straight-line pass on a CL soil under low-topography, wet-season condition (from table 8) would be 76 to 90% (estimated at 83%).

Use of probability of "go" tables

69. The following paragraphs explain how the probability tables (tables 10 and 11) can be used. The particular data to be used, like that for the soil trafficability classification scheme, will depend upon the amount and type of information known, i.e. the topography, moisture condition, and the soil type and system in which the soil is classified.

70. Probability of "go" for vehicles within specific VCI categories. The probability of "go" on sloping ground may be estimated for tracked or wheeled vehicles within VCI categories. If, for example, a low-topography, high-moisture condition prevails and the soil is a CL with a 15% slope, the probability of "go" for tracked vehicles in category 3 (VCI 50 to 59) would be 63% (from table 10).

71. Comparison of probabilities between two vehicle categories. The probabilities of "go" can be compared for vehicles in two different categories to estimate the advantage that vehicles in one category would have over vehicles in another. For example, under the same set of conditions as those stated in the preceding paragraph, tracked vehicles in category 5 (VCI 70 to 79) would have a 40% probability of "go" (table 10). Since the table shows the probability of "go" for vehicles in category 3 to be 63%, the difference, 23% (63 minus 40), indicates the advantage in performance of vehicles in category 3.

72. Comparison of probabilities for different soil types and slopes.

The probabilities of "go" for vehicles within a given category can be compared for two or more different soil types and slopes in order to determine quantitatively the advantage that one route would have over another. For example, if tracked vehicles in category 3 were being considered for use in a low-topography area under a high-moisture condition (table 10), the probability of "go" along route A, a CH soil with maximum slopes of 30%, would be 40%; the probability of "go" along route B, a CL soil with maximum slopes of 15%, would be 63%. Thus, from the standpoint of soil type and slope, route B would have a decided advantage of 23% (63 minus 40) over route A.

Estimation of Percentage of Area Trafficable

73. Cumulative frequency curves of the RCI data for all fine-grained soils and coarse-grained soils with fines tested in Thailand are shown for wet-season (high and low topography) and high-moisture (low topography) conditions in plate 10. For purposes of comparison, a similar set of curves is also shown for humid-temperate soils of the United States. The cumulative frequency of RCI, in percent, is plotted for a 10-300 range of RCI. The curves in plate 10 permit one to estimate the percentage of area trafficable for a given vehicle under a wet-season or high-moisture condition. Because the data are biased toward wetter-than-average conditions, estimates of percentages of trafficable areas made from the curves will be smaller than actual, i.e. on the conservative side. Examination of the data reveals that in Thailand a vehicle with a VCI of 80 can make 50 passes in 60% of the soil areas under average conditions in the wet season, and in 40% of the low-lying soil areas under poorest trafficability conditions (high-moisture condition). The same vehicle can make 1 pass (vehicle cone index is  $80 \times 0.50$  or 40 for 1 pass) in 89% of the area under average conditions in the wet season and in 79% of the low-lying areas under poorest trafficability conditions. It should be emphasized that passable areas are considered strictly in terms of the bearing strength of soils on level surfaces. The presence and orientation of slopes and obstacles and

consideration of the extent of areas of sand would affect the percentage of area trafficable. A comparison of the curves for Thailand and U. S. soils shows that the Thailand soils have slightly higher strengths (68 median RCI for the Thailand soils versus 63 for the U. S. soils) under high-moisture conditions and slightly lower strengths (97 median RCI for the Thailand soils versus 107 for the U. S. soils) under wet-season conditions.



## PART V: CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

74. Based on the data and discussions presented herein, it is concluded that the scheme for classifying trafficability of Thailand soils has the following advantages:

- a. It rates soil types (both USCS and USDA) according to their median rating cone index under high- and low-topography, wet-season conditions, and under low-topography, high-moisture condition.
- b. From a consideration of cumulative frequency of occurrence of rating cone index, it permits a ready estimate of the chances of successful travel of any military vehicle (whose vehicle cone index is known) on any soil type under three space-time moisture conditions.

75. The conclusions that follow are based on the soil information derived from the various analyses of the basic data.

a. Soil strength.

- (1) Soils in low-lying positions (low topography) generally have lower strengths than those in high-lying positions (high topography). (Paragraphs 34-38 and tables 1-4.)
- (2) The initial strength (cone index) of the 6- to 12-in. soil layer ranges from 57 to 78 units higher than that of the 0- to 6-in. layer. (Paragraph 34 and table 1.)
- (3) The remolding indexes are generally highest for the silty coarse-grained soils and highly plastic fine-grained soils and lowest for the low-plasticity and loamy fine-grained soils. (Paragraph 36 and table 2.)
- (4) The remolding index of a soil decreases with an increase in the moisture level. Under highest moisture level (poorest trafficability condition) the soils retain an average of two-thirds of their initial strength after remolding. (Paragraph 36 and table 2.)
- (5) The initial and remolded strengths of soils (cone index and rating cone index) are highest for the USCS coarse-grained soils with fines and USDA sandy soils, intermediate for the fine-grained soils, and lowest for the organic soils. The rating cone index averages 60 units higher for high-topography than for low-topography position, and that for low-topography positions averages 35 units higher under wet-season condition than under

high-moisture condition. (Paragraphs 34 and 37 and tables 1 and 3.)

- (6) Soils in Thailand have slightly higher strengths under high-moisture condition and slightly lower strengths under wet-season condition than do soils in humid-temperate areas of the United States. (Paragraph 73 and plate 10.)

b. Soil-moisture content.

- (1) For a given topography-moisture level the moisture contents are lowest for the USCS coarse-grained soils with fines and USDA sandy soils, intermediate for the USCS low-plasticity, fine-grained soils and USDA loamy soils, and highest for the USCS high-plasticity and organic soils and USDA clayey soils. (Paragraph 39 and table 5.)
- (2) The average moisture contents in the wet season are about 5% higher for low-topography than for high-topography positions, and those in low-topography positions are about 4% higher under high-moisture than under wet-season conditions. (Paragraph 39 and table 5.)

c. Density.

- (1) The densities are generally highest for the USCS coarse-grained soils with fines and low-plasticity fine-grained soils and USDA gravelly and sandy soils, and lowest for the USCS highly plastic and organic soils and USDA clayey soils. (Paragraph 40 and table 6.)
- (2) The average density is about 2 lb per cu ft higher under high-topography than under low-topography, wet-season condition. (Paragraph 40 and table 6.)

d. Specific gravity.

- (1) Specific gravities are highest for the USCS plastic soils and USDA gravelly and clayey soils, and lowest for the USCS low-plasticity and organic soils and USDA silty and sandy soils. (Paragraph 41 and table 7.)
- (2) The specific gravity of soils on high-topography position averages 0.04 more than that on low-topography position.

e. Probability of "go."

- (1) The probability of "go" for a given vehicle on a given soil type is highest for high-topography, wet-season condition, intermediate for low-topography, wet-season condition, and lowest for low-topography, high-moisture condition. For a given topography-moisture condition, the probability of "go" decreases for soils in the

following order: clean, coarse-grained soils, coarse-grained soils, coarse-grained soils with fines, fine-grained soils, and organic soils. (Table 8.)

- (2) On a basis of soil strength only, vehicles with vehicle cone indexes less than 80 (i.e. practically all military vehicles except those intended primarily for highway use) can negotiate at least 60% of the soil areas during average wet-season conditions and at least 40% of the areas during poorest trafficability conditions. (Paragraph 73 and plate 10.)

#### Recommendations

76. It is recommended that:

- a. In order to improve the reliability of the probability-of-"go" information that has been derived from a statistical analysis of existing data, new or additional rating cone index information should be collected on USCS soil type-moisture conditions with fewer than 15 observations. This information should include data from all soil types except SM and CL under high-topography, wet-season condition; SP-SM, SM-SC, and organic soil types under low-topography, wet-season condition; and SP-SM, SC, CL-ML, and organic soil types under low-topography, high-moisture condition.
- b. Sheargraph measurements should be incorporated in the trafficability classification scheme if investigations in progress show that these measurements can be related to vehicle traction.

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Table 1  
Mean and Standard Deviation Values for USCS and USDA Soil Types  
Cone Index, 0- to 6-in. and 6- to 12-in. Layers

USCS							USDA						
Type	0- to 6-in. Layer			6- to 12-in. Layer			Type	0- to 6-in. Layer			6- to 12-in. Layer		
	n	$\bar{x}$	s	n	$\bar{x}$	s		n	$\bar{x}$	s	n	$\bar{x}$	s
<u>High-Topography, Wet-Season Condition</u>													
GC	--	--	--	1	617	--	GL	2	137	76	4	617	188
GM	--	--	--	2	462	407	GSCL	1	171	--	2	524	320
SP-SM	1	273	--	--	--	--	SC	--	--	--	2	511	338
SM-SC	3	163	71	10	378	238	GSL	1	273	--	7	340	258
ML	13	197	115	11	304	259	LS	17	290	164	22	301	226
SC	7	155	85	17	286	187	CL	9	204	162	8	278	207
SM	42	243	149	59	269	209	SL	35	184	129	49	264	189
CL	8	100	63	23	258	221	S1C	2	127	83	2	252	27
CH	8	168	185	15	205	163	L	19	149	106	28	218	206
MH	17	128	66	14	179	76	S1L	10	98	42	6	210	261
CL-ML	3	89	18	8	135	41	SCL	6	145	63	9	199	133
							GCL	--	--	--	2	198	333
							S1CL	1	126	--	4	188	121
							C	3	142	79	6	171	51
							S	5	215	72	6	153	37
							GS1L	--	--	--	1	125	--
All soils	102	188	132	160	258	200	All soils	111	185	129	158	263	205
<u>Low-Topography, Wet-Season Condition</u>													
GC	--	--	--	1	430	--	GCL	1	98	--	4	522	293
CL-ML	12	156	103	41	313	188	GL	--	--	--	2	385	198
ML	51	192	151	50	303	206	GS1CL	--	--	--	1	371	--
SM	61	239	160	95	282	176	GSL	3	246	150	5	349	216
SC	10	181	145	35	264	190	GSCL	--	--	--	2	290	198
SM-SC	7	248	134	20	250	183	SL	84	218	155	140	252	171
CL	84	155	152	241	209	160	LS	28	186	116	40	250	143
SP-SM	1	100	--	9	193	103	S	5	233	289	14	240	146
CH	57	74	49	119	134	90	CL	14	100	55	51	229	159
MH	28	99	44	35	125	73	L	57	145	125	122	221	172
OH	8	52	45	6	31	13	S1L	83	142	123	98	210	172
							SCL	3	104	45	34	195	139
							C	25	63	35	43	184	141
							S1CL	32	114	129	51	154	144
							S1	4	300	299	2	141	5
							S1C	23	63	58	39	97	51
All soils	319	158	142	652	217	168	All soils	362	152	138	648	216	166
<u>Low-Topography, High-Moisture Condition</u>													
CL-ML	7	119	117	20	266	209	GSL	--	--	--	1	311	--
ML	28	124	109	21	257	221	S1	2	337	392	--	--	--
SM-SC	1	249	--	4	249	259	LS	9	145	102	13	208	144
SM	19	171	159	32	201	114	S	4	259	327	6	207	134
SC	2	68	8	12	167	82	GCL	1	103	--	--	--	--
CL	38	74	30	98	127	55	S1L	23	85	40	26	190	180
MH	13	91	34	16	116	66	SL	30	126	75	46	178	141
SP-SM	1	78	--	2	100	35	L	31	83	36	58	167	139
CH	29	47	24	53	94	57	CL	12	76	39	22	158	76
OH	4	30	17	4	35	14	SCL	--	--	--	15	123	54
							C	16	61	35	18	122	60
							S1CL	15	63	37	30	105	58
							S1C	20	48	27	27	76	43
All soils	142	95	91	262	152	123	All soils	163	93	87	262	152	123

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.

Table 2

Mean and Standard Deviation Values for USCS and USDA Soil Types  
Remolding Index, 6- to 12-in. Layer

USCS				USDA			
Type	n	$\bar{x}$	s	Type	n	$\bar{x}$	s
<u>High-Topography, Wet-Season Condition</u>							
SM	32	1.32	0.79	LS	12	1.62	0.96
CH	11	1.00	0.16	CL	5	1.19	0.12
MH	9	1.02	0.36	S1C	2	1.16	0.06
SM-SC	4	0.98	0.22	SL	29	1.04	0.57
SC	10	0.94	0.27	S	4	1.03	0.48
CL-ML	7	0.83	0.28	SCL	8	0.95	0.26
CL	16	0.82	0.27	S1L	5	0.92	0.29
ML	7	0.69	0.33	C	3	0.90	0.18
GM	1	0.51	--	S1CL	3	0.89	0.26
GC	1	0.45	--	L	23	0.83	0.28
				GS1L	1	0.71	--
				GSL	1	0.51	--
				GCL	1	0.51	--
				GL	1	0.45	--
All soils	98	1.03	0.55	All soils	98	1.03	0.55
<u>Low-Topography, Wet-Season Condition</u>							
SP-SM	6	1.31	0.68	S	9	1.34	0.69
SM	55	0.89	0.57	GSL	2	1.14	0.02
CH	101	0.88	0.24	LS	22	1.07	0.59
MH	34	0.79	0.28	C	32	0.87	0.25
SC	23	0.77	0.29	S1	1	0.86	--
CL	187	0.71	0.23	S1L	72	0.83	0.30
OH	5	0.62	0.12	S1CL	47	0.77	0.26
CL-ML	24	0.57	0.21	GSCL	1	0.77	--
ML	35	0.51	0.27	S1C	39	0.76	0.19
SM-SC	13	0.51	0.22	CL	38	0.75	0.20
				L	98	0.69	0.28
				SL	97	0.65	0.39
				SCL	26	0.64	0.16
				GCL	1	0.51	--
All soils	483	0.76	0.34	All soils	485	0.76	0.34
<u>Low-Topography, High-Moisture Condition</u>							
SP-SM	2	1.22	0.56	S	5	1.32	0.69
CH	50	0.79	0.24	LS	9	0.86	0.65
MH	16	0.66	0.21	S1L	21	0.78	0.29
CL	91	0.65	0.20	C	15	0.75	0.14
OH	4	0.65	0.11	CL	21	0.73	0.22
SC	11	0.64	0.30	S1CL	29	0.71	0.27
SM	20	0.53	0.31	S1C	27	0.68	0.17
ML	17	0.43	0.22	SCL	15	0.60	0.15
CL-ML	12	0.42	0.13	L	50	0.59	0.22
SM-SC	3	0.34	0.21	SL	38	0.47	0.27
All soils	226	0.66	0.31	All soils	230	0.66	0.31

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.

Table 3

Mean and Standard Deviation Values for USCS and USDA Soil Types  
Rating Cone Index, 6- to 12-in. Layer

USCS				USDA			
Type	n	$\bar{x}$	s	Type	n	$\bar{x}$	s
<u>High-Topography, Wet-Season Condition</u>							
GC	1	253	--	LS	12	325	268
SM	32	227	197	S1C	2	274	16
SC	10	221	165	GL	1	253	--
SM-SC	4	170	45	CL	5	245	69
CH	11	169	81	SCL	8	221	193
CL	16	150	125	SL	29	171	108
MH	9	148	83	S	4	145	69
CL-ML	7	118	62	C	3	145	69
ML	7	104	89	S1CL	3	136	124
GM	1	89	--	L	23	124	91
				S1L	5	99	47
				GS1L	1	89	--
				GCL	1	89	--
				GSL	1	53	--
All soils	98	180	148	All soils	98	180	147
<u>Low-Topography, Wet-Season Condition</u>							
SP-SM	6	234	184	S	9	301	267
SM	55	197	170	GSL	2	293	94
SC	23	144	102	LS	22	230	164
CL-ML	24	108	74	C	32	141	129
CH	100	108	90	SL	97	121	123
CL	187	102	60	L	98	119	116
ML	34	101	91	S1	1	118	--
MH	33	90	57	CL	38	117	53
SM-SC	13	85	53	GSCL	1	116	--
OH	5	22	13	S1L	71	111	64
				GCL	26	91	56
				S1CL	46	84	52
				S1C	39	78	54
				GCL	1	53	--
All soils	480	121	111	All soils	483	120	111
<u>Low-Topography, High-Moisture Condition</u>							
SP-SM	2	132	98	S	5	315	332
SM	22	129	114	LS	9	134	75
SC	11	113	106	CL	21	102	44
ML	17	100	98	S1L	21	94	46
CL	91	79	40	C	15	87	42
CH	50	70	44	L	50	85	69
MH	16	67	36	SCL	15	79	42
CL-ML	12	65	36	SL	38	75	82
SM-SC	3	47	37	S1CL	29	66	33
OH	4	24	14	S1C	27	53	35
All soils	228	86	81	All soils	230	86	81

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.



Table 4

**Mean and Standard Deviation Values for USCS and USDA Soil Types**  
**Sheargraph Shear Strength in psi at 10-psi Normal Pressure**

USCS							USDA						
Soil-to-Soil Shear			Rubber-to-Soil Shear				Soil-to-Soil Shear			Rubber-to-Soil Shear			
Type	n	$\bar{x}$	s	n	$\bar{x}$	s	Type	n	$\bar{x}$	s	n	$\bar{x}$	s
<b>High-Topography, Wet-Season Condition</b>													
CL	4	8.88	1.23	4	7.45	0.85	S1L	1	9.00	--	1	7.10	--
MH	4	8.88	1.90	4	6.43	1.11	CL	4	8.98	1.09	5	6.56	1.86
CH	2	8.40	0.28	3	4.30	1.21	L	8	8.94	1.45	8	6.49	0.88
ML	4	8.33	1.36	4	6.00	0.59	S1C	1	8.60	--	1	5.70	--
CL-ML	3	8.13	1.95	3	6.70	0.96	S1CL	1	8.20	--	1	3.60	--
SM	11	7.61	1.00	11	5.24	0.76	SL	7	7.80	0.97	7	5.91	0.61
SC	2	7.20	0.99	2	5.90	1.13	LS	6	7.18	0.85	6	4.88	0.79
							SCL	1	6.50	--	1	5.10	--
							C	1	6.20	--	1	5.00	--
All soils	30	8.12	1.30	31	5.87	1.19	All soils	30	8.12	1.30	31	5.87	1.19
<b>Low-Topography, Wet-Season Condition</b>													
CH	18	8.07	1.24	18	5.73	1.45	SCL	1	10.00	--	1	6.90	--
CL	46	7.77	2.13	42	6.24	1.58	GCL	1	9.40	--	1	6.60	--
SM-SC	5	7.46	1.16	5	5.16	0.86	CL	10	8.36	1.99	8	6.43	1.13
SC	3	7.27	0.65	3	5.83	0.76	S1L	35	7.75	1.62	34	5.87	1.58
SM	31	7.23	1.46	31	5.25	1.04	SL	42	7.59	1.32	42	5.37	1.02
SP-SM	1	7.10	--	1	5.70	--	L	24	7.15	2.22	23	5.51	1.27
ML	18	7.06	1.95	17	5.26	1.09	S	1	7.10	--	1	5.70	--
CL-ML	8	6.76	2.39	7	5.34	1.28	S1CL	17	7.04	2.28	15	6.25	1.65
MH	10	6.02	1.88	7	5.31	1.01	C	5	6.98	2.26	3	5.83	0.97
							LS	12	6.33	0.64	12	4.98	0.63
							GSL	1	4.00	--	1	4.40	--
							S1C	2	3.65	2.33	1	3.30	--
All soils	140	7.39	1.88	131	5.66	1.35	All soils	151	7.37	1.84	142	5.64	1.32
<b>Low-Topography, High-Moisture Condition</b>													
CH	4	8.85	0.82	4	6.43	0.13	GCL	1	8.20	--	1	7.40	--
CL-ML	4	7.00	3.36	3	5.57	2.61	S1L	10	7.53	2.66	9	6.02	1.66
SM	6	6.68	1.35	6	4.90	0.49	SL	5	6.86	1.36	5	4.62	0.92
CL	16	6.67	3.11	12	5.68	1.81	CL	5	6.84	3.54	3	5.17	3.00
ML	5	4.84	2.03	4	4.35	1.49	C	3	6.33	3.00	1	6.40	--
MH	3	3.80	1.85	--	--	--	LS	4	5.93	0.77	4	4.73	0.51
							L	11	5.93	2.06	10	4.68	0.92
							S1CL	4	5.23	4.09	2	6.70	0.42
							S1C	1	2.00	--			
All soils	38	6.47	2.68	29	5.43	1.57	All soils	44	6.43	2.52	35	5.31	1.46

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.

Table 5

Mean and Standard Deviation Values for USCS and USDA Soil Types  
Moisture Content, % Dry Weight, 0- to 6-in. and 6- to 12-in. Layers

USCS							USDA						
Type	0- to 6-in. Layer			6- to 12-in. Layer			Type	0- to 6-in. Layer			6- to 12-in. Layer		
	n	$\bar{x}$	s	n	$\bar{x}$	s		n	$\bar{x}$	s	n	$\bar{x}$	s
High-Topography, Wet-Season Condition													
SP-SM	1	11.0	--	--	--	--	LS	16	9.1	3.8	19	11.1	4.6
SM-SC	3	16.5	2.6	8	13.0	3.1	S	5	8.5	1.0	5	12.2	6.7
SM	39	12.9	6.5	49	13.4	7.3	GL	2	18.3	0.4	1	14.0	--
GC	--	--	--	1	14.0	--	SC	--	--	--	2	14.1	8.5
CL-ML	3	15.9	1.1	8	15.8	3.3	GSL	1	11.0	--	5	14.6	3.3
SC	7	20.5	5.1	14	18.0	4.5	GSCL	1	17.4	--	--	--	--
ML	13	19.0	5.9	11	18.6	8.2	SL	34	19.7	9.7	43	16.9	9.1
CL	8	22.7	5.0	20	18.8	4.6	GS1L	--	--	--	1	17.2	--
GM	--	--	--	1	22.4	--	SCL	5	19.9	9.8	8	18.8	4.4
CH	7	31.4	6.0	14	30.9	5.4	GCL	--	--	--	2	19.4	4.2
MH	17	41.6	8.5	14	39.1	8.3	L	17	27.5	13.6	27	23.8	11.5
							S1L	10	33.4	10.2	6	24.5	8.2
							C	2	23.3	10.3	6	28.6	8.3
							CL	8	28.5	11.3	7	29.1	9.7
							S1C	2	31.8	4.5	2	31.1	3.4
							S1CL	1	35.4	--	4	37.3	6.1
All soils	98	21.5	12.2	140	19.6	10.4	All soils	104	21.1	12.0	138	19.5	10.3
Low-Topography, Wet-Season Condition													
GC	--	--	--	1	12.6	--	LS	28	15.5	5.7	37	14.6	4.7
SM	58	15.5	6.5	90	15.6	6.1	GSCL	--	--	--	2	15.4	4.0
CL-ML	11	19.9	3.6	40	16.1	5.1	GS1CL	--	--	--	1	15.7	--
SM-SC	7	17.5	10.2	20	16.2	4.4	GSL	2	16.9	2.1	4	16.1	4.2
SP-SM	1	18.5	--	9	16.4	7.3	GL	--	--	--	1	17.5	--
SC	10	17.1	5.9	34	18.5	9.9	GCL	1	17.4	--	4	18.0	8.4
ML	52	22.2	10.0	49	18.5	6.9	S	4	15.5	11.8	14	18.3	7.3
CL	81	23.4	7.0	231	22.5	7.3	SL	83	18.0	8.5	139	18.3	12.0
CH	50	36.6	10.8	113	35.5	15.8	SCL	3	25.2	16.3	34	18.5	4.5
MH	26	46.0	20.4	34	45.8	20.5	L	56	25.9	16.2	118	22.7	12.5
OH	8	66.2	20.1	6	93.4	11.9	S1L	79	28.5	12.7	93	27.1	12.8
							CL	14	31.6	15.3	51	27.5	19.6
							C	22	39.0	13.4	39	32.6	7.9
							S1	4	23.8	8.0	2	33.5	12.6
							S1CL	32	31.7	10.6	50	34.9	17.7
							S1C	19	48.7	18.2	35	42.5	19.4
All soils	304	26.5	15.2	627	24.5	15.0	All soils	347	26.4	14.8	624	24.6	15.0
Low-Topography, High-Moisture Condition													
CL-ML	7	21.2	4.6	16	17.9	4.7	LS	8	18.3	6.9	12	18.3	5.1
SM	16	16.6	6.1	30	18.0	5.5	SCL	--	--	--	15	18.3	5.0
SM-SC	1	16.6	--	4	20.0	5.0	GCL	1	17.4	--	--	--	--
SC	2	20.0	7.0	12	20.7	3.8	GSL	--	--	--	1	20.4	--
ML	25	24.2	7.7	17	22.0	8.3	SL	25	19.9	5.3	41	22.6	16.9
SP-SM	1	16.8	--	2	24.6	2.3	S1	1	17.7	--	--	--	--
CL	35	26.4	5.5	93	24.8	7.0	S	3	17.0	13.4	6	23.1	5.9
CH	18	44.3	12.8	44	39.6	15.7	L	30	24.4	6.0	53	24.3	11.7
MH	13	46.9	19.9	14	52.7	27.3	S1L	18	27.9	7.9	21	26.0	9.0
OH	4	69.6	12.9	4	92.3	14.9	CL	12	33.2	13.7	22	28.4	12.5
							C	14	41.3	15.4	16	34.0	7.1
							S1CL	12	38.1	13.4	26	39.4	21.7
							S1C	16	52.7	18.1	23	49.0	21.8
All soils	122	30.3	15.7	236	28.5	16.8	All soils	140	30.3	15.1	236	28.5	16.8

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.

Table 6

Mean and Standard Deviation Values for USCS and USDA Soil Types

Dry Density, lb per cu ft, 6- to 12-in. Layer

USCS				USDA			
Type	n	$\bar{x}$	s	Type	n	$\bar{x}$	s
<u>High-Topography, Wet-Season Condition</u>							
SM-SC	5	112.2	8.2	GSL	3	109.5	13.2
GC	1	104.8	--	GL	1	104.8	--
ML	3	102.0	2.7	SL	27	102.7	5.8
CL-ML	8	101.3	5.8	S	5	96.1	8.8
SM	37	98.3	6.5	L	14	98.7	5.0
CL	13	96.6	6.7	SCL	8	95.3	11.5
SC	9	95.8	11.1	GCL	1	94.6	--
GM	1	94.6	--	LS	14	94.4	3.0
CH	5	82.4	6.6	SiL	1	91.8	--
MH	7	75.1	10.9	C	2	85.6	2.0
				SiCL	4	79.1	10.7
				CL	6	78.9	12.1
				SiC	2	75.5	1.7
All soils	89	96.2	10.9	All soils	88	96.0	10.6
<u>Low-Topography, Wet-Season Condition</u>							
SM-SC	12	101.9	5.1	GSiCL	1	117.3	--
SC	13	100.3	7.5	GCL	1	110.4	--
SM	48	99.5	7.7	GSCL	1	107.9	--
CL-ML	23	99.4	8.4	GSL	2	103.4	13.5
ML	29	97.7	7.9	SCL	23	100.5	7.2
CL	135	97.1	8.2	SL	72	99.9	7.6
SP-SM	6	92.0	5.7	LS	22	98.9	5.0
CH	54	80.5	10.3	L	73	97.3	10.4
MH	8	69.9	10.5	CL	26	96.5	6.5
OH	4	47.7	4.7	SiL	22	94.2	7.9
				S	10	90.9	5.4
				SiCL	21	85.4	15.4
				C	25	79.6	7.5
				SiC	32	77.4	14.2
All soils	332	93.9	12.4	All soils	331	93.9	12.4

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.

Table 7

Mean and Standard Deviation Values for USCS and USDA Soil Types  
Specific Gravity, 6- to 12-in. Layer

USCS				USDA			
Type	n	$\bar{x}$	s	Type	n	$\bar{x}$	s
<u>High-Topography, Wet-Season Condition</u>							
GM	2	3.10	0.28	GL	5	2.97	0.28
GC	1	2.96	--	GSCL	2	2.91	0.37
MH	12	2.77	0.11	GSL	8	2.90	0.30
SC	15	2.77	0.24	GCL	2	2.81	0.15
SM-SC	12	2.71	0.20	SiCL	2	2.77	0.11
CH	12	2.69	0.06	CL	7	2.75	0.11
CL	18	2.68	0.03	L	19	2.69	0.06
SM	40	2.65	0.10	GSiL	1	2.68	--
ML	7	2.64	0.02	SiC	2	2.68	0.02
CL-ML	3	2.64	0.02	SiL	5	2.67	0.08
				SL	39	2.65	0.07
				C	6	2.65	0.05
				S	1	2.64	--
				LS	18	2.63	0.02
				SCL	5	2.63	0.03
All soils	122	2.70	0.14	All soils	122	2.70	0.14
<u>Low-Topography, Wet-Season Condition</u>							
CH	86	2.68	0.07	GSiCL	1	3.00	--
SC	20	2.67	0.11	GL	2	2.98	0.23
MH	34	2.66	0.08	GSL	5	2.79	0.11
CL	128	2.66	0.06	GCL	3	2.76	0.05
CL-ML	24	2.65	0.04	GSCL	1	2.73	--
SM	65	2.65	0.07	Si	2	2.71	0.03
SP-SM	4	2.65	0.06	SiC	25	2.71	0.04
SM-SC	8	2.65	0.05	CL	26	2.68	0.05
ML	33	2.64	0.05	C	26	2.67	0.07
OH	6	2.61	0.18	SCL	13	2.65	0.03
				SiCL	36	2.65	0.08
				SiL	79	2.65	0.07
				L	65	2.65	0.07
				S	8	2.64	0.05
				LS	28	2.64	0.02
				SL	87	2.64	0.04
All soils	408	2.66	0.07	All soils	407	2.66	0.07

Note: n = number of samples;  $\bar{x}$  = mean or average; s = one standard deviation.



Table 8  
Soil Trafficability Classification in USCS Terms

Soil Type Symbol	Strength Measurements					Vehicle Category										
	Mean															
	Surface Shear Strength*					Vehicle Cone Index										
	CI	AI	S/A	S/S	NCI	Range RCI**	1	2	3	4	5	6	7			
							0	20	40	60	80	100	120	140	160	180

High-Topography, Wet-Season Condition

Low-Topography, Wet-Season Condition

Low-Topography, High-Moisture Condition

Note: Vehicle category and cone index range are given in paragraph 52.

\* Sheargraph soil-to-rubber (S/R) and soil-to-soil (S/S) strength in psi for a normal load of 10 psi.

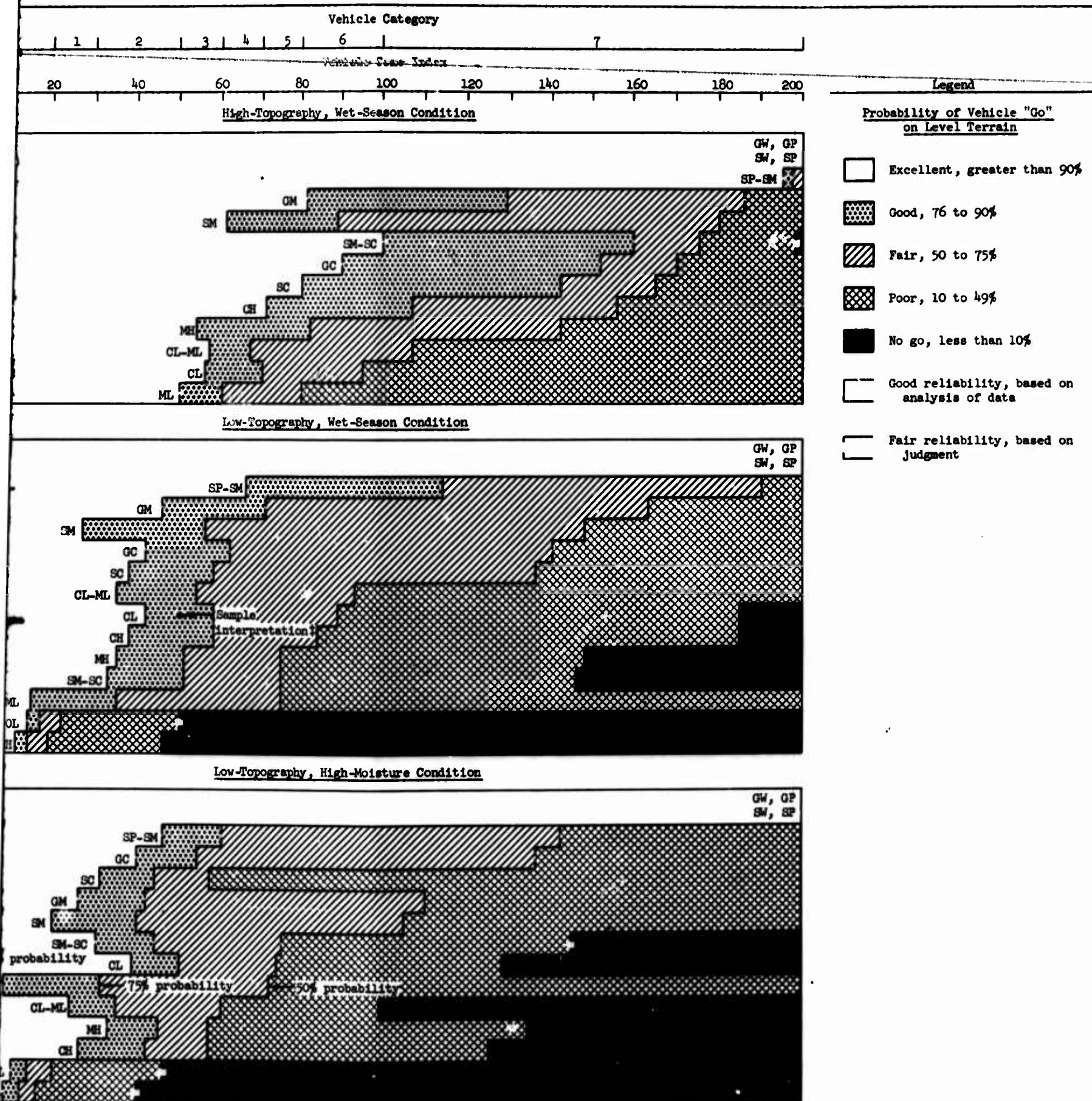
\*\* Excluding lowest 10% and highest 10% of all RCI values.

† Estimated from textural, plasticity, and organic properties of soil under given moisture condition.

†† Based on analysis of less than five samples.

‡ A vehicle with a vehicle cone index of 50 would have a 75-90% chance of "go" on a CL soil of low-topography, wet-season condition.

Table 8  
Soil Trafficability Classification in USCS Terms



Paragraph 52.  
(S) strength in psi for a normal load of 10 psi.  
ues.  
properties of soil under given moisture condition.  
a 75-90% chance of "go" on a CL soil of low-topography, wet-season condition.



Table 9  
Soil Trafficability Classification in USDA Terms

Strength Measurements							Vehicle Category									
Mean																
Soil Type Symbol	Surface Shear Strength*					Range RCI**	Vehicle Cone Index									
	CI	RI	S/R	S/S	RCI											
							0	20	40	60	80	100	120	140	160	
High-Topography, Wet-Season Condition																
S(fn)	153	1.03†	--	--	145†	160-300+††										
CL	278	1.19	6.56	8.98†	245	145-300+										
LS	301	1.62	4.88	7.18	325	82-300+										
SL	264	1.04	5.91	7.80	171	48-290										
C	171	0.90†	5.00†	6.20†	145†	78-290††										
SC	511†	--	--	--	--	73-205††										
SCL	199	0.95	5.10†	6.50†	221	68-300+										
SiCL	188†	0.89†	3.60†	8.20†	136†	64-205††										
SiC	252†	1.16†	5.70†	8.60†	274†	60-210††										
L	218	0.83	6.49	8.94	124	55-170										
SiL	210	0.92	7.10†	9.00†	99	52-156										
Si	--	--	--	--	--	48-150††										
Low-Topography, Wet-Season Condition																
S(fn)	240	1.34	7.50†	7.10†	301	48-300+										
LS	250	1.07	4.98	6.33	230	80-300+										
CL	229	0.75	6.43	8.36	117	53-185										
C	184	0.87	5.83†	6.98	141	48-300+										
SiL	210	0.83	5.87	7.75	111	50-209										
Si	141†	0.86†	--	--	118†	48-204††										
L	221	0.69	5.51	7.15	119	38-221										
SL	252	0.65	5.37	7.59	121	20-293										
SC	--	--	--	--	--	40-205††										
SCL	195	0.64	6.90†	10.00†	91	35-201										
SiCL	154	0.77	6.25	7.04	84	33-128										
SiC	97	0.76	3.30†	3.65†	78	20-151										
Low-Topography, High-Moisture Condition																
LS	208	0.86	4.73†	5.93†	134	39-300+										
CL	158	0.73	5.17†	6.48	102	45-158										
SiL	190	0.78	6.02	7.53	94	53-149										
Si	--	--	--	--	--	47-154††										
C	122	0.75	6.40†	6.33†	87	45-145										
SC	--	--	--	--	--	38-136††										
SCL	123	0.60	--	--	79	37-126										
L	167	0.59	4.68	5.93	85	33-135										
S	207	1.32	--	--	315	32-120††										
SiCL	105	0.71	6.70†	5.23†	66	25-105										
SL	178	0.47	4.62	6.86	75	9-221										
SiC	76	0.68	--	2.00†	53	15-101										

Note: Vehicle category and cone index range are given in paragraph 52.

\* Sheargraph soil-to-rubber (S/R) and soil-to-soil (S/S) strength in psi for a normal load of 10 psi.

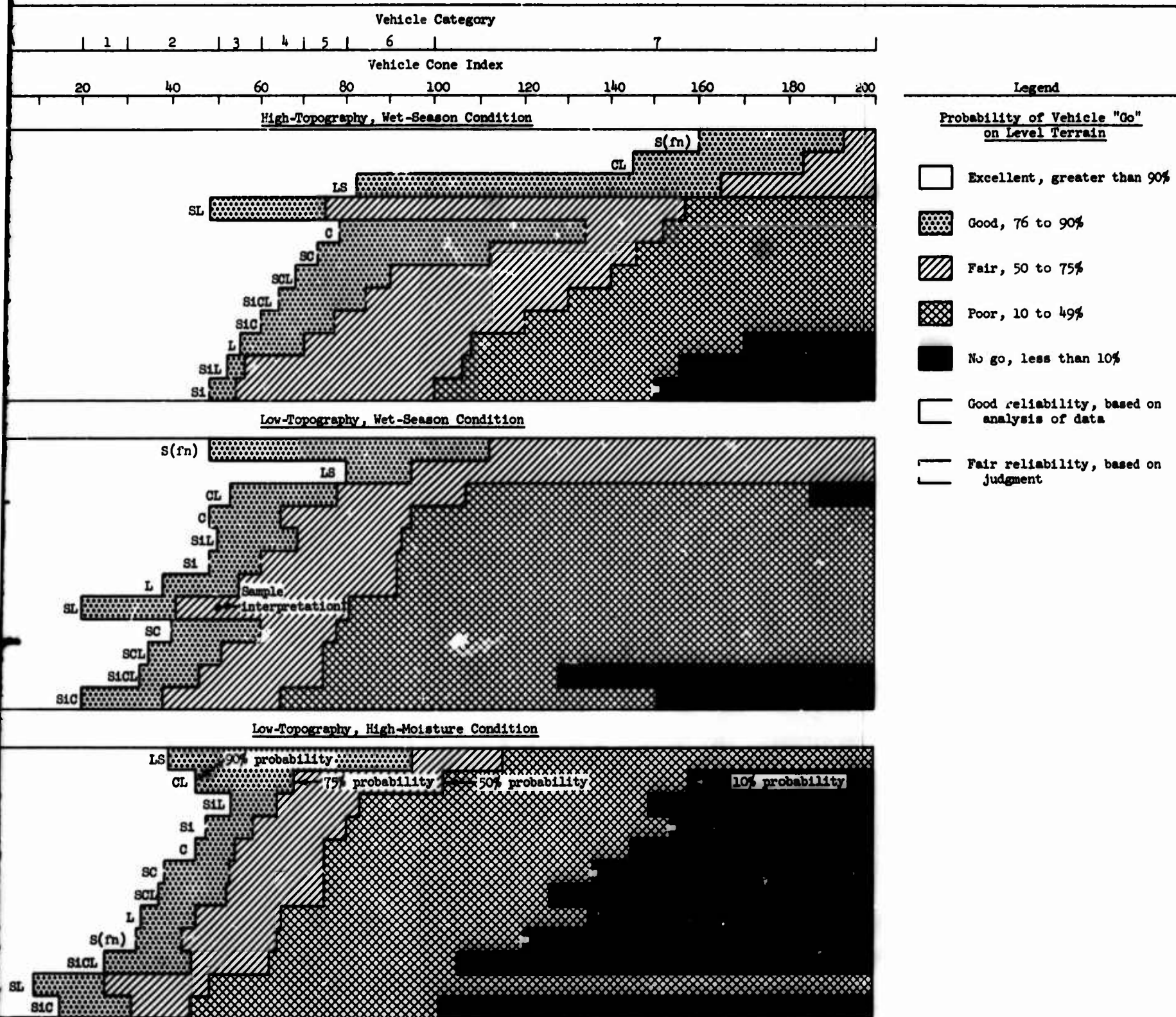
\*\* Excluding lowest 10% and highest 10% of all RCI values.

† Based on analysis of less than five samples.

†† Estimated from textural, plasticity, and organic properties of soil under given moisture condition.

‡ A vehicle with a vehicle cone index of 50 would have a 50-75% chance of "go" on an SL soil of low-topography, wet-season condition.

Table 9  
Soil Trafficability Classification in USDA Terms



in paragraph 52.  
l (S/S) strength in psi for a normal load of 10 psi.  
values.  
e properties of soil under given moisture condition.  
have a 50-75% chance of "go" on an SL soil of low-topography, wet-season condition.



Table 10

Percent Probability of "Go" for Tracked and Wheeled Vehicles on Level and Slope

Soil Type Symbol	No. of Samples	Vehicle Category 1* VCI Range 20-29								Vehicle Category 2 VCI Range 30-49								Vehicle Category 3 VCI Range 50-59								Vehicle Category 4** VCI Range 60-69							
		Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope			
		0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45
High-Topography, Wet-Season Condition																																	
GW, GP SW, SP	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
SP-SM†	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
GM†	1	100	100	100	99	100	100	100	95	100	100	98	94	100	100	96	90	98	96	93	90	98	95	92	86	95	93	90	86	95	92	86	92
SM	32	97	96	95	93	97	96	94	88	95	94	92	86	95	94	90††	78	92	89	84	78	92	88	81	73	88	83	78	74	88	82	78	74
SM-SC†	4	100	100	100	100	100	100	100	100	100	100	100	98	100	100	100	95	100	99	97	94	100	99	96	91	99	97	95	92	99	96	96	92
GC†	1	100	100	100	99	100	100	100	96	100	100	99	96	100	100	97	93	99	97	95	92	99	96	94	89	96	94	93	90	96	94	94	90
SC	10	100	100	100	97	100	100	100	90	100	100	94	90	100	100	90	90	94	90	90	90	94	90	90	90	90	90	90	90	90	90	90	90
CH	11	100	100	100	98	100	100	100	91	100	100	95	91	100	100	91	82	95	91	91	82	95	91	86	82	91	89	82	82	91	87	87	86
MH	9	100	100	100	95	100	100	100	78	100	100	88	78	100	100	78	78	88	78	78	75	88	78	78	66	78	78	78	66	78	78	78	78
CL-ML	7	100	100	100	96	100	100	100	86	100	100	92	86	100	100	86	71	92	86	86	71	92	86	73	71	86	82	71	71	86	79	79	79
CL	16	100	100	100	92	100	100	97	82	100	95	91	80	100	94	88	63	91	86	76	61	91	83	69	50	82	74	63	54	82	71	71	71
ML†	7	100	100	100	87	100	100	99	68	100	95	83	65	100	92	75	50	83	72	61	48	33	69	55	40	68	59	50	42	68	56	56	56
Low-Topography, Wet-Season Condition																																	
GW, GP SW, SP	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
SP-SM	6	100	100	100	100	100	100	100	91	100	100	100	88	100	100	100	83	100	98	83	83	100	93	83	83	91	83	83	83	83	91	83	83
GM†	0	100	99	94	86	100	98	91	78	94	90	85	77	94	88	82	72	85	80	75	72	85	79	74	69	78	75	72	69	78	74	74	74
SM	55	91	87	80	76	91	85	78	72	80	77	75	71	80	76	74	71	75	73	71	70	75	73	71	66	72	71	71	68	72	71	71	71
GC†	0	100	98	91	82	100	96	88	74	91	86	80	73	91	85	76	69	80	75	72	69	80	74	71	65	74	72	69	66	74	71	71	71
SC	23	100	97	87	78	100	94	83	72	87	82	77	71	87	80	74	69	77	73	69	68	77	72	69	61	72	69	69	61	72	69	69	69
CL-ML	24	96	91	87	76	96	90	82	73	87	79	74	73	87	77	73	69	74	73	73	66	74	73	71	48	73	72	69	51	73	71	71	71
CL	187	98	96	92	80	98	95	87	70	92	85	77	69	92	83	73	57	77	72	67	55	77	71	62	45	70	65	57	48	70	63	63	63
CH	100	95	93	89	78	95	92	84	65	89	81	76	62	87	80	74	52	76	69	59	50	76	65	55	44	65	58	52	46	65	56	56	56
MH	33	95	92	88	73	95	91	83	57	88	81	68	56	88	79	60	45	68	59	54	44	68	58	50	34	57	52	45	37	57	51	51	51
SM-SC	13	92	91	85	74	92	89	81	54	85	79	65	54	85	78	54	46	65	54	54	45	65	54	50	38	54	52	46	38	54	51	51	51
ML	36	84	79	69	65	84	77	68	57	69	68	62	56	69	67	58	47	62	58	55	46	62	57	50	43	57	53	47	44	57	51	51	51
OL†	0	45	34	23	6	45	32	12	0	23	14	2	0	23	11	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
OH	5	31	20	20	0	31	20	12	0	20	8	0	0	20	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Low-Topography, High-Moisture Condition																																	
GW, GP SW, SP	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
SP-SM†	2	100	100	97	84	100	100	91	74	97	90	81	73	97	87	75	69	81	75	72	68	81	74	71	64	74	72	69	65	74	71	71	71
GC†	0	100	98	90	78	100	96	85	72	90	83	75	71	90	81	73	67	75	73	70	67	75	72	69	63	72	70	57	63	72	69	69	69
SC	11	95	88	82	60	95	87	73	45	82	69	55	45	82	66	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
GM†	0	92	85	78	72	92	83	74	67	78	74	71	66	78	73	69	61	71	68	65	60	71	67	63	56	67	64	61	57	67	64	64	64
SM	23	88	84	74	68	88	82	71	65	74	70	67	65	74	70	65	65	67	65	65	64	67	65	65	57	65	65	65	59	65	65	65	65
SM-SC†	3	96	89	80	69	96	87	75	59	80	74	67	57	80	72	63	47	67	61	54	46	67	59	50	39	59	53	47	40	59	51	51	51
CL	91	96	93	89	73	96	92	81	60	89	79	70	58	89	76	65	42	70	63	55	40	70	61	49	25	60	53	42	28	60	50	50	50
ML	17	80	74	65	63	80	71	65	55	65	65	61	54	65	65	58	41	61	57	53	40	61	56	47	32	55	51	41	34	55	48	48	48
CL-ML	12	87	75	75	63	87	75	71	42	75	69	59	38	75	68	50	33	59	46	33	32	59	43	33	17	42	33	33	22	42	33	33	33
MH	16	97	92	82	64	97	89	75	35	82	73	55	33	82	71	40	19	55	36	31	19	55	35	25	19	35	29	19	19	35	26	26	26
CH	50	91	87	78	54	91	85	68	45	78	64	52	43	78	60	48	30	52	47	40	29	52	15	35	24	45	38	30	25	45	37	37	37
OL†	0	43	32	20	0	43	29	11	0	20	8	0	0	20	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OH†	4	35	23	11	0	35	21	2	0	11	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\* Probability of "go" based on median vehicle cone index within vehicle categories 1-6 and minimum vehicle cone index for category 7.

\*\* Probability of "go" for vehicles in category 7 equal to or less than given value.

† Soils with estimated probabilities.

†† Sample interpretation: A wheeled vehicle with a vehicle cone index in the range 30-49 has an 90% probability of "go" on an SM soil at 30% slope under high-topography.

Table 10  
eled Vehicles on Level and Sloping Terrain Classified in USCS Terms

Vehicle Category 4* VCI Range 60-69								Vehicle Category 5 VCI Range 70-79								Vehicle Category 6 VCI Range 80-99								Vehicle Category 7** VCI Range 100 or Greater							
Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope			
15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
95	93	90	86	95	92	89	83	92	90	87	83	92	89	86	80	87	85	83	79	87	84	81	75	84	82	80	76	84	81	78	70
88	83	78	74	88	82	77	72	81	78	75	72	81	77	73	68	75	73	72	68	75	72	72	65	72	72	68	65	72	72	65	62
99	97	95	92	99	96	94	89	96	94	92	89	96	94	91	86	92	91	89	86	92	90	88	82	90	88	86	83	90	87	85	80
96	94	93	90	96	94	91	86	94	92	90	87	94	92	89	84	90	88	86	83	90	88	85	80	88	86	84	81	88	85	83	78
90	90	90	90	90	90	90	85	90	90	90	88	90	90	90	80	90	90	85	80	90	90	80	80	90	83	80	80	90	81	80	80
91	89	82	82	91	87	82	77	86	82	82	79	86	82	82	72	82	82	77	72	82	82	72	64	82	75	72	66	82	73	72	54
78	78	78	66	78	78	72	66	78	75	66	66	78	73	66	66	66	66	66	66	66	66	66	55	66	66	66	58	66	66	66	56
86	82	71	71	86	79	71	55	78	71	71	64	78	71	71	27	71	71	55	22	71	71	40	14	71	50	27	14	71	44	14	14
82	74	63	54	82	71	60	44	69	61	56	44	69	60	50	41	56	48	44	39	56	46	44	38	44	44	41	38	44	44	38	31
68	59	50	42	68	56	46	36	55	48	43	37	55	47	40	33	43	39	36	32	43	38	34	29	38	35	33	30	38	35	32	27

ography, Wet-Season Condition

	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
91	83	83	83	91	83	83	83	83	83	83	83	83	83	73	83	83	83	69	83	83	83	66	83	83	73	66	83	83	66	66	66
78	75	72	69	78	74	71	66	74	72	70	66	74	71	69	63	70	68	66	62	70	67	65	59	67	65	63	60	67	65	62	56
72	71	71	68	72	71	70	62	71	70	69	63	71	70	66	59	69	65	62	58	69	64	62	56	64	62	59	56	64	62	56	56
74	72	69	66	74	71	68	61	71	69	66	62	71	68	65	58	66	64	61	58	66	63	60	53	63	61	58	54	63	60	57	50
72	69	69	61	72	69	66	61	69	68	61	61	69	66	61	58	61	61	61	57	61	61	61	52	61	61	58	51	61	61	56	48
73	72	69	51	73	71	61	42	71	66	54	42	71	62	48	40	54	46	42	39	54	43	42	38	42	42	40	38	42	42	38	38
70	65	57	48	70	63	53	37	62	55	50	39	62	54	45	31	50	43	37	30	50	42	34	24	41	36	37	25	41	35	29	18
65	58	52	46	65	56	49	38	55	50	48	39	55	50	44	34	48	42	38	33	48	41	36	21	40	37	34	24	40	36	32	21
57	52	45	37	57	51	42	29	50	44	39	29	50	43	34	27	39	32	29	27	39	30	27	21	30	28	27	23	30	27	27	15
54	52	46	38	54	51	43	38	50	45	38	38	50	44	38	34	38	38	38	33	38	38	38	15	38	38	34	20	38	38	31	15
57	53	47	44	57	51	46	40	50	46	44	41	50	46	43	37	44	42	40	37	44	42	39	33	42	39	37	34	42	39	36	28
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ography, High-Moisture Condition

100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
74	72	69	65	74	71	68	61	71	69	66	62	71	68	64	58	66	64	61	58	66	63	60	54	63	61	58	55	63	60	57	51
72	70	67	63	72	69	66	60	69	67	64	60	69	66	63	57	64	62	60	56	64	62	58	52	61	59	57	53	61	58	55	49
45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	37	45	45	45	39	45	45	45	37
67	64	61	57	67	64	60	52	63	60	58	53	63	60	56	48	38	55	52	48	58	54	50	43	54	51	48	44	54	50	46	39
65	65	65	59	65	65	63	50	65	64	61	51	64	65	57	41	61	55	50	38	61	53	48	35	52	49	41	35	52	48	35	35
59	53	47	40	59	51	44	33	50	46	41	35	50	45	39	27	41	38	33	26	41	37	30	19	36	32	27	20	36	31	24	13
60	53	42	28	60	50	36	18	49	40	30	19	49	37	25	14	30	23	18	14	30	21	16	9	20	17	14	8	20	16	13	6
55	51	41	34	55	48	38	30	47	40	35	30	47	39	32	30	35	31	30	30	35	30	30	23	30	30	25	30	30	30	23	23
42	33	33	22	42	33	29	8	33	32	25	8	33	30	17	8	35	14	8	8	25	10	8	8	8	8	8	8	8	8	8	8
35	29	19	19	35	26	19	19	25	19	19	19	25	19	19	19	19	19	19	19	19	19	19	12	19	19	19	14	19	19	19	6
45	38	30	25	45	37	28	17	35	29	26	20	35	29	24	11	26	23	17	11	26	23	12	10	22	15	11	10	22	13	10	8
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

at 30% slope under high-topography, wet-season condition.

Table 11

Percent Probability of "Go" for Tracked and Wheeled Vehicles on L

Soil Type Symbol	No. of Sam- ples	Vehicle Category 1* VCI Range 20-29								Vehicle Category 2 VCI Range 30-49								Vehicle Category 3 VCI Range 50-59								Vehicle VCI Range 60-69			
		Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope				Tracked % Slope				Wheeled % Slope				Tracked % Slope			
		0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45
High-Topography, Wet-Season																													
S( $r_n$ )†	4	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
LS	12	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	92	83	92	92	92	83
SL	29	97	96	93	89	97	95	91	83	93	90	88	81	93	90	86	72	88	85	79	72	88	83	76	72	83	78	72	72
CL	5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
C†	3	100	100	100	97	100	100	99	93	100	98	96	93	100	98	95	90	96	94	92	89	96	94	91	86	93	92	90	87
SC†	0	100	100	100	98	100	100	100	93	100	100	97	92	100	99	95	87	97	94	91	86	97	93	89	81	93	90	87	82
SCL	8	100	100	100	100	100	100	100	93	100	100	100	91	100	100	100	75	100	97	88	75	100	95	82	75	93	85	75	71
SiC†	2	100	100	100	97	100	100	100	85	100	100	94	84	100	100	90	73	94	88	81	72	94	86	76	64	85	79	73	66
SiCL†	3	100	100	100	100	100	100	100	90	100	100	97	88	100	100	93	78	97	92	86	77	97	90	82	70	90	84	78	71
L	23	100	100	100	93	100	100	98	79	100	97	90	77	100	96	83	70	90	82	75	69	90	80	72	61	79	74	70	65
SiL	5	100	100	100	91	100	100	100	60	100	100	79	60	100	100	60	60	79	60	60	60	79	60	60	60	60	60	60	60
Si†	0	100	100	100	80	100	100	95	69	100	91	75	68	100	87	72	61	75	70	66	60	75	69	64	52	69	65	61	54
Low-Topography, Wet-Season																													
S( $r_n$ )	9	100	100	100	99	100	100	94	83	100	91	89	81	100	89	89	78	89	86	78	78	89	84	78	78	83	78	78	73
LS	22	100	98	91	91	100	96	91	91	91	91	91	91	91	91	91	91	91	91	91	89	91	91	91	75	91	91	91	79
CL	38	100	99	97	90	100	99	94	83	97	93	89	81	97	92	86	74	89	85	79	73	89	83	76	63	83	78	74	64
C	32	100	99	97	87	100	98	94	75	97	91	86	70	97	90	84	60	86	81	66	59	86	77	63	50	75	65	60	53
SiL	71	96	95	93	89	96	95	91	78	93	91	87	76	93	90	82	62	87	80††	74	60	87	79	68	49	78	72	62	53
L	98	98	94	88	77	98	93	84	67	88	82	74	66	88	80	70	58	74	69	63	57	74	68	60	48	67	62	58	50
SL	97	87	83	76	65	87	82	72	56	76	70	62	55	76	68	58	50	62	57	53	49	62	56	52	43	56	53	50	44
SiCL	46	94	90	87	66	94	89	78	57	87	75	64	56	87	71	61	41	64	59	54	40	64	58	48	35	57	51	41	36
SC†	0	100	95	90	81	100	94	86	70	90	85	79	67	90	83	75	50	79	74	62	49	79	71	56	45	70	60	50	44
SCL	26	100	96	84	73	100	93	80	61	84	78	70	59	84	77	65	39	70	64	58	38	70	63	47	29	61	54	39	36
SiC	39	87	82	74	59	87	80	67	50	74	65	57	49	74	63	51	36	57	51	49	35	57	50	41	30	50	45	36	33
Si†	1	100	100	100	85	100	100	94	71	100	91	81	70	100	88	75	59	81	74	67	58	81	72	63	49	71	65	59	53
Low-Topography, High-Moist																													
LS	9	100	97	89	89	100	95	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	79	89	89	89	89
CL	21	100	99	95	86	100	98	90	78	95	89	86	76	95	87	86	62	86	84	72	62	86	80	67	57	78	70	62	64
SiL	21	97	95	95	92	97	95	95	73	95	95	89	70	95	95	80	57	89	78	66	52	89	75	62	30	73	64	57	36
Si†	0	100	100	100	82	100	100	91	67	100	90	79	65	100	86	72	50	79	70	61	49	79	68	56	42	67	59	50	44
C	15	100	100	100	77	100	100	89	60	100	85	73	58	100	82	67	46	73	64	53	45	73	62	50	37	60	52	46	36
SC†	0	100	97	88	76	100	95	84	61	88	82	73	59	88	80	67	47	73	65	56	45	73	63	50	37	61	53	47	36
SCL	15	100	97	87	76	100	95	83	60	87	82	68	60	87	81	60	33	68	60	60	32	68	60	46	21	60	56	33	26
L	50	95	91	84	65	95	89	77	51	84	72	61	49	84	70	55	40	61	53	46	36	61	51	43	23	51	44	40	26
St	5	100	100	100	80	100	100	90	68	100	86	80	64	100	83	80	60	80	74	60	60	80	71	60	60	63	60	60	60
SiCL	29	90	86	83	60	90	85	72	47	83	68	57	45	83	64	52	28	57	50	42	25	57	48	35	14	47	39	28	16
SL	38	77	67	60	44	77	65	54	30	60	51	40	30	60	49	32	26	40	31	29	26	40	30	28	24	30	28	26	26
SiC	27	81	74	50	35	81	70	48	30	59	43	33	30	59	39	30	15	33	30	30	15	33	30	22	13	30	27	15	16

\* Probability of "go" based on median vehicle cone index within vehicle categories 1-6 and minimum vehicle cone index for category 7.

\*\* Probability of "go" for vehicles in category 7 equal to or less than given value.

† Soils with estimated probabilities.

†† Sample interpretation: A tracked vehicle with a vehicle cone index in the range 50-59 has an 80% probability of "go" on an SiL soil at 15% slope under



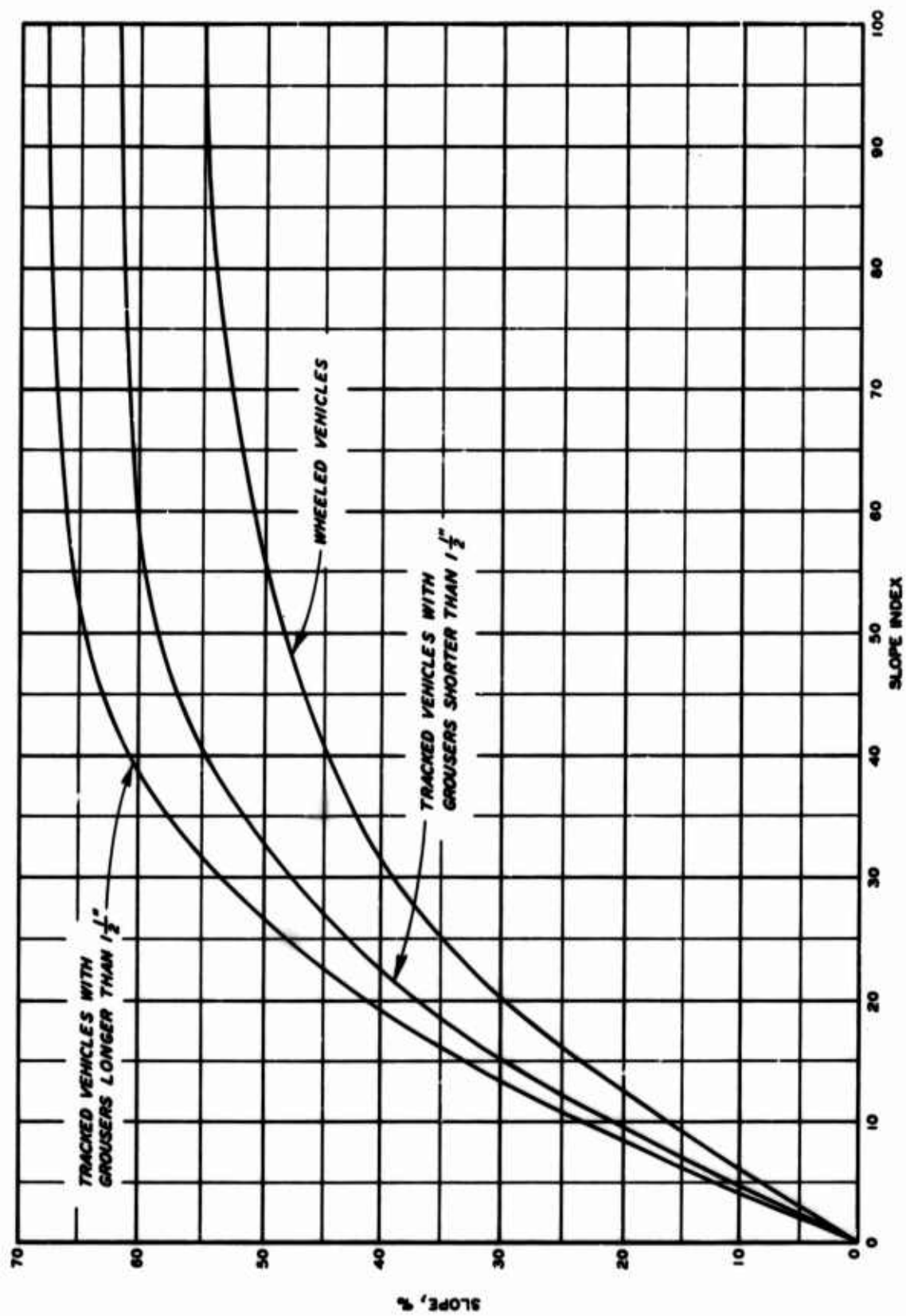
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es on Level and Sloping Terrain Classified in USDA Terms

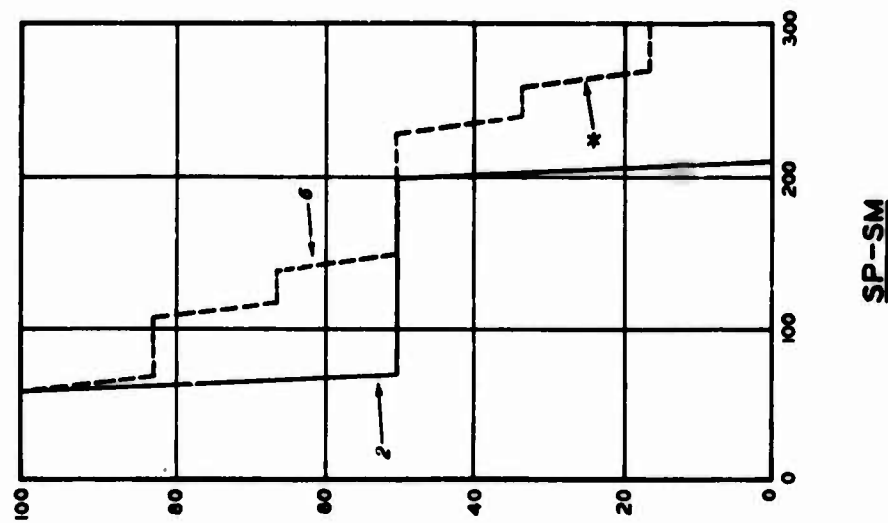
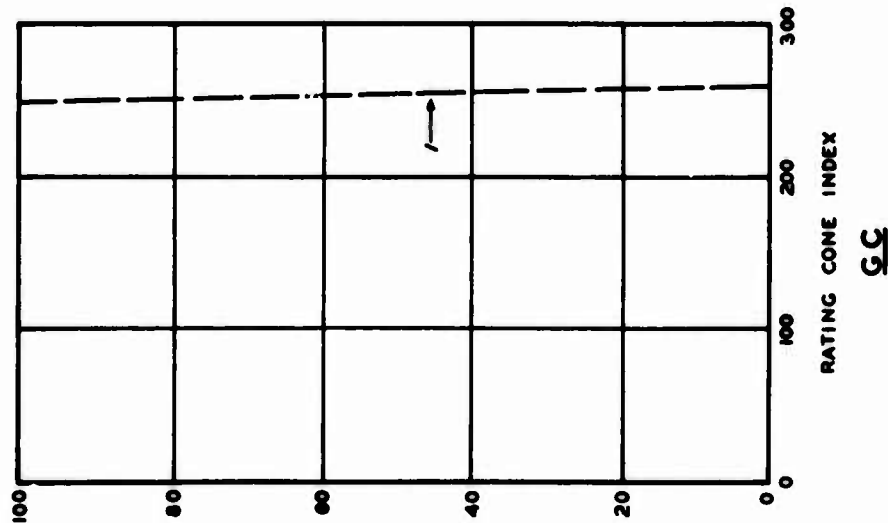
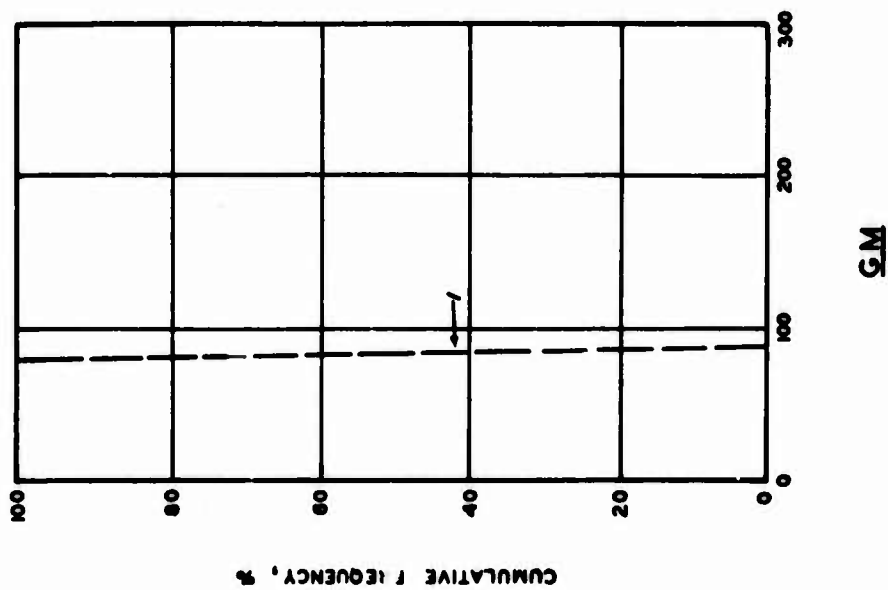
Vehicle Category 4 VCI Range 60-69										Vehicle Category 5 VCI Range 70-79										Vehicle Category 6 VCI Range 80-99										Vehicle Category 7** VCI Range 100 or Greater									
Wheeled % Slope					Tracked % Slope					Wheeled % Slope					Tracked % Slope					Wheeled % Slope					Tracked % Slope					Wheeled % Slope					Tracked % Slope				
30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45	0	15	30	45		
t-Season Condition																																							
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99		
92	83	92	92	88	83	92	91	83	83	92	88	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83		
72	72	83	77	72	72	76	72	72	72	76	72	72	69	72	72	68	72	72	72	66	72	72	69	66	72	72	66	62	62	62	62	62	62	62	62	62	62		
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
90	87	93	91	88	83	91	89	87	84	91	88	86	80	87	85	83	80	87	84	82	76	84	82	80	77	84	82	79	67	67	67	67	67	67	67	67	67		
87	82	93	89	85	78	89	86	83	79	89	85	81	73	83	81	78	71	83	80	76	62	80	77	73	64	80	76	69	54	54	54	54	54	54	54	54	54		
75	75	93	83	75	64	82	75	75	70	82	75	75	50	75	75	64	50	75	75	50	50	75	59	50	50	75	54	50	50	50	50	50	50	50	50	50	50		
73	66	85	77	70	59	76	72	67	60	76	71	64	53	67	63	59	52	67	62	56	46	61	57	53	47	61	56	50	41	41	41	41	41	41	41	41	41		
78	71	90	83	75	64	82	77	72	65	82	75	69	58	72	68	64	57	72	67	61	50	67	63	58	52	67	62	56	45	45	45	45	45	45	45	45	45		
70	63	79	73	67	53	72	69	65	55	72	68	61	42	65	59	53	39	65	58	48	31	57	51	42	32	57	49	35	26	26	26	26	26	26	26	26	26		
60	60	60	60	60	51	60	60	60	56	60	60	60	40	60	60	51	40	60	60	40	20	60	48	40	26	60	43	40	20	20	20	20	20	20	20	20	20	20	
61	54	69	64	58	46	64	60	55	48	64	59	52	38	55	51	46	36	55	50	42	26	50	44	38	28	50	42	34	18	18	18	18	18	18	18	18	18		
-Season Condition																																							
78	78	83	78	78	78	78	78	78	78	78	78	78	72	78	78	78	70	78	78	78	67	78	78	72	67	78	79	67	67	67	67	67	67	67	67	67	67		
91	79	91	91	86	73	91	89	82	73	91	88	75	70	82	73	73	69	82	73	73	68	73	73	70	68	73	73	68	68	68	68	68	68	68	68	68	68		
74	66	83	77	71	53	76	73	68	55	76	72	63	43	68	60	53	41	68	59	48	34	58	50	43	36	58	48	39	24	24	24	24	24	24	24	24	24		
53	53	75	64	58	42	63	59	56	43	63	58	50	40	56	47	42	40	56	45	40	31	44	41	40	34	44	40	40	28	28	28	28	28	28	28	28	28		
62	51	78	70	56	42	68	60	52	45	68	58	49	37	52	48	42	37	52	47	39	27	46	41	37	29	46	40	35	25	25	25	25	25	25	25	25	25		
58	50	67	61	55	42	60	57	52	43	60	56	48	39	52	46	42	38	52	45	41	30	44	42	39	32	44	41	37	25	25	25	25	25	25	25	25	25		
50	44	56	52	47	41	52	49	44	42	52	48	43	38	44	43	41	37	44	42	40	32	42	40	38	33	42	40	35	30	30	30	30	30	30	30	30	30		
41	36	57	50	39	29	48	40	37	31	48	39	35	23	37	34	29	21	37	33	26	9	32	28	23	11	32	26	19	9	9	9	9	9	9	9	9	9		
50	46	70	57	48	42	56	49	47	43	56	48	45	39	47	44	42	38	47	44	40	34	43	41	39	35	43	40	37	31	31	31	31	31	31	31	31	31		
33	32	61	50	36	23	47	38	34	23	47	37	29	23	34	26	23	23	34	24	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23		
36	32	50	42	34	21	41	35	33	24	41	35	30	18	33	28	21	18	33	26	18	15	25	19	18	16	25	18	18	13	13	13	13	13	13	13	13	13		
59	50	71	64	55	45	63	58	51	46	63	56	49	42	51	48	45	41	51	48	44	37	47	45	42	38	47	44	40	33	33	33	33	33	33	33	33	33		
-Moisture Condition																																							
89	84	89	89	89	60	89	89	89	63	89	89	79	50	89	72	60	47	89	69	55	44	67	58	50	44	67	56	44	44	44	44	44	44	44	44	44	44		
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lope under low-topography, wet-season condition.



# CHART FOR DETERMINING SLOPE INDEX





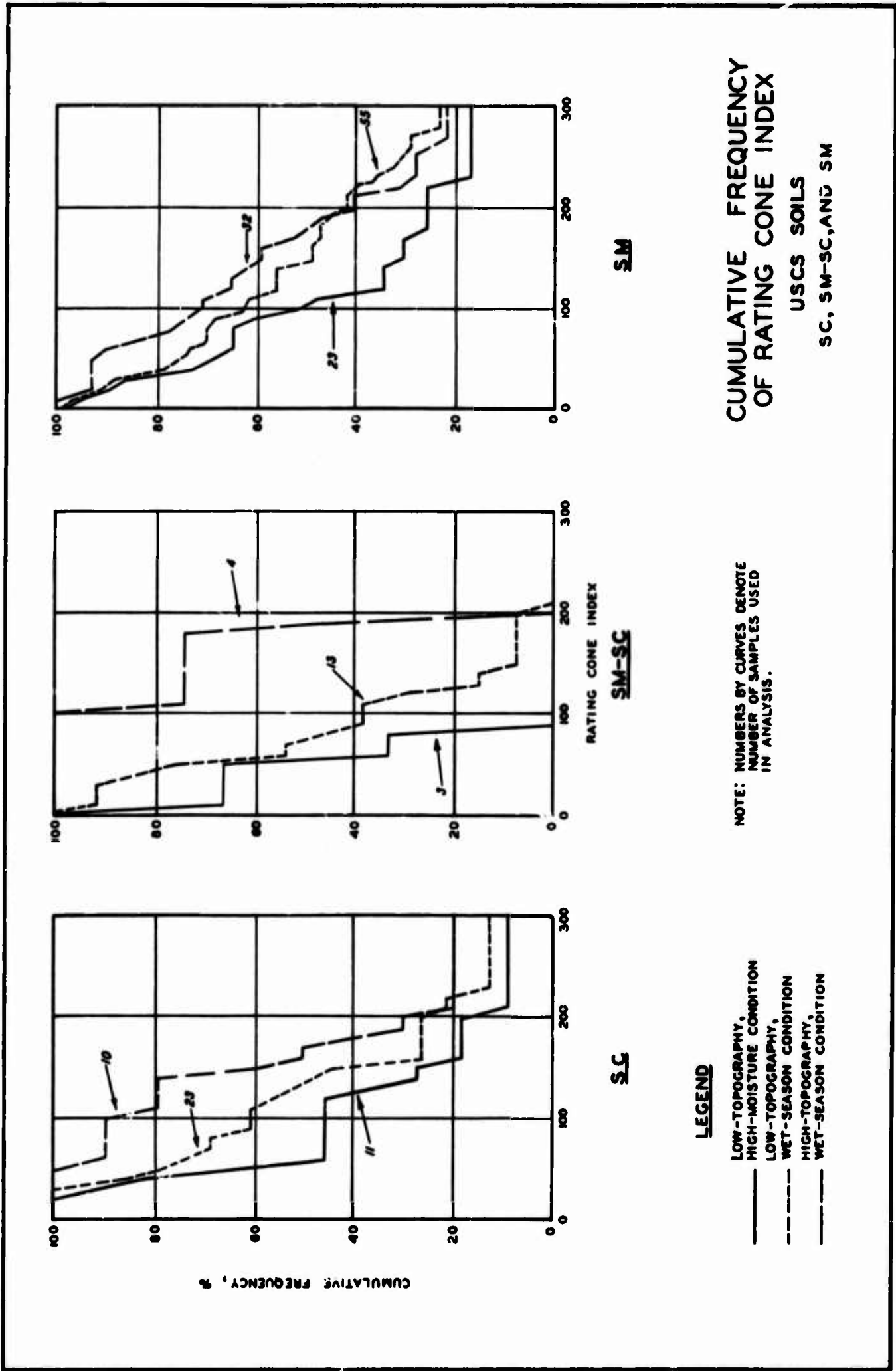
LEGEND

- LOW-TOPOGRAPHY,  
HIGH-MOISTURE CONDITION
- - - LOW-TOPOGRAPHY,  
WET-SEASON CONDITION
- HIGH-TOPOGRAPHY,  
WET-SEASON CONDITION

NOTE: NUMBERS BY CURVES DENOTE  
NUMBER OF SAMPLES USED  
IN ANALYSIS.

\* SAMPLE INTERPRETATION:  
25% OF SAMPLES OCCURRED  
AT RATING CONE INDEX OF  
285 OR HIGHER.

CUMULATIVE FREQUENCY  
OF RATING CONE INDEX  
USCS SOILS  
GM, GC, AND SP-SM



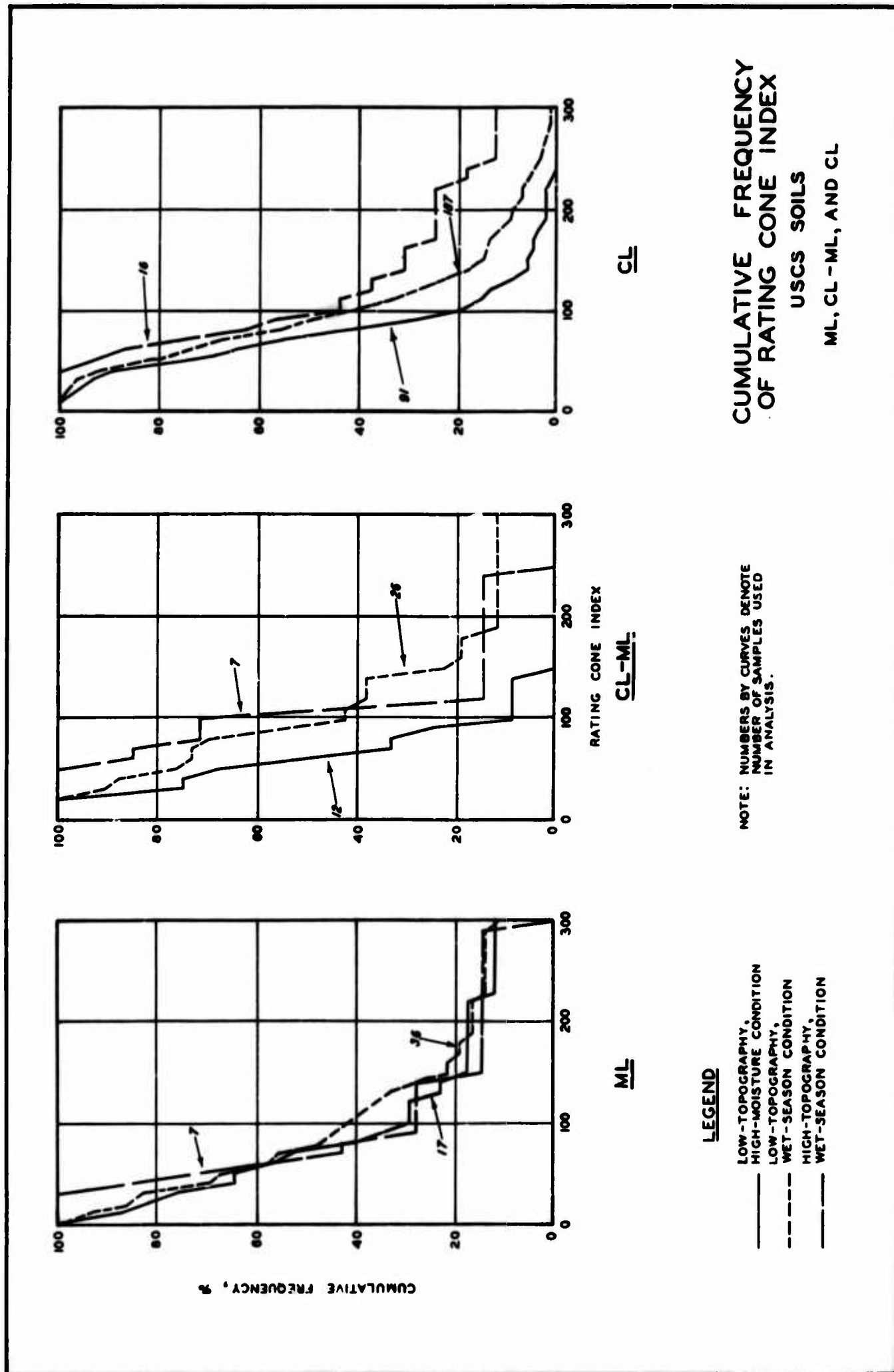


PLATE 4



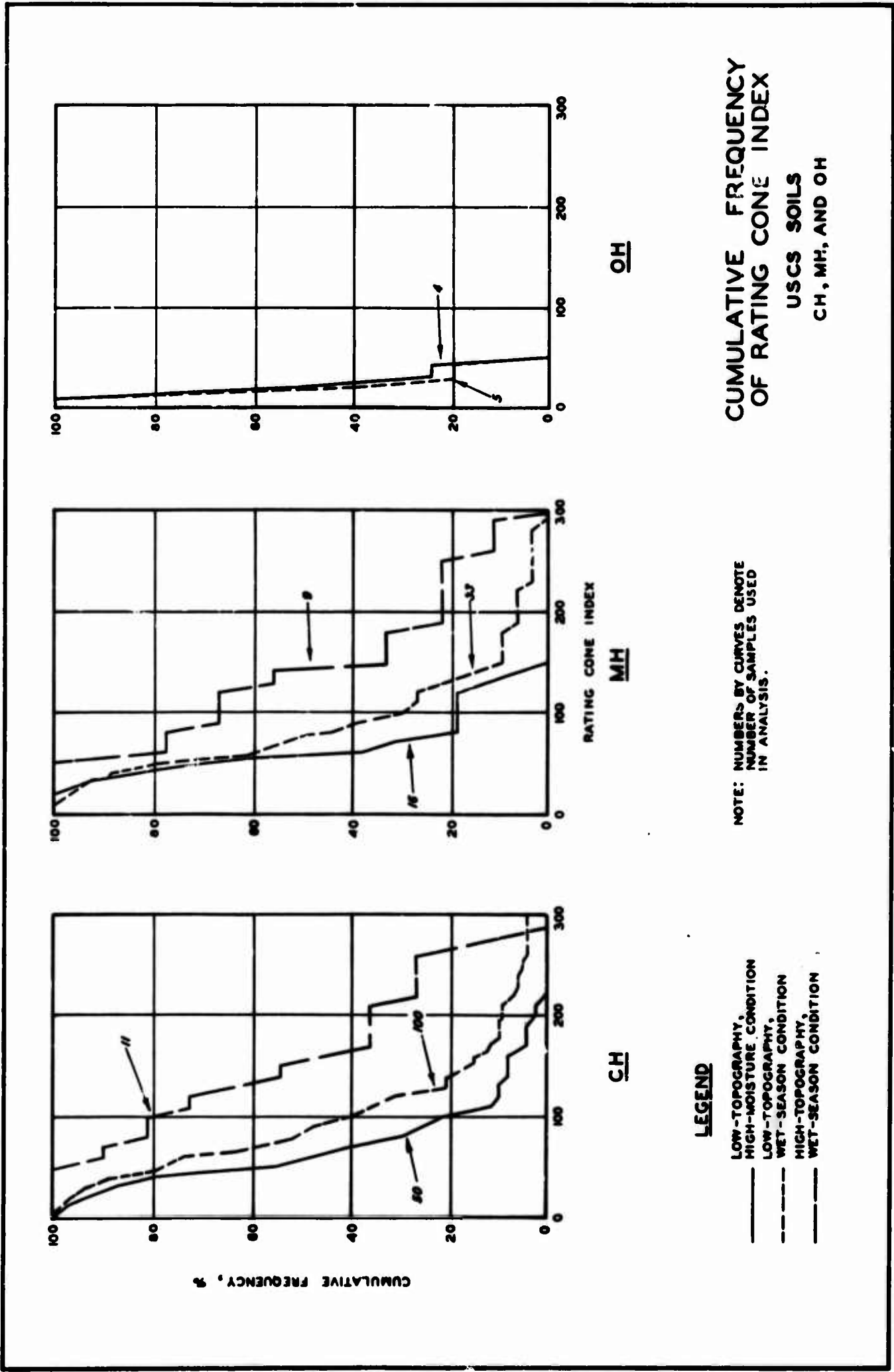
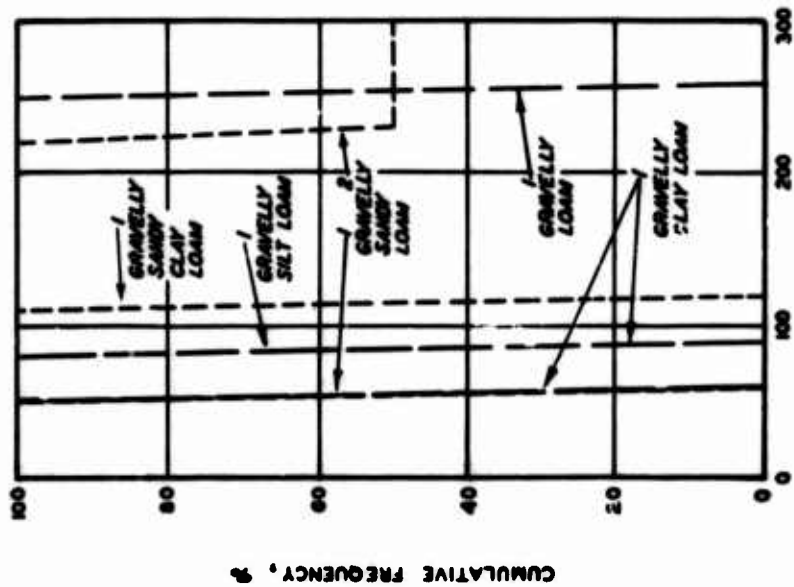


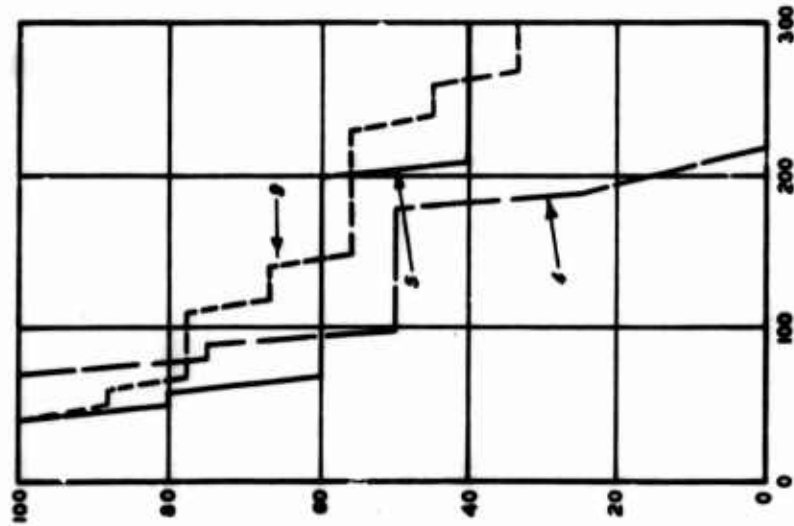
PLATE 6



**GRAVELLY SOILS**

**LEGEND**

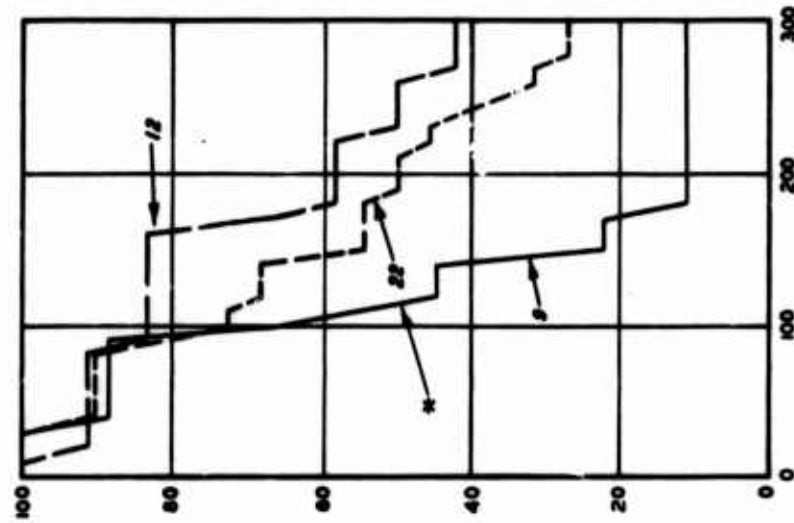
- LOW-TOPOGRAPHY, HIGH-MOISTURE CONDITION
- - - LOW-TOPOGRAPHY, WET-SEASON CONDITION
- HIGH-TOPOGRAPHY, WET-SEASON CONDITION



**SAND (FINE)**

NOTE: NUMBERS BY CURVES DENOTE NUMBER OF SAMPLES USED IN ANALYSIS.

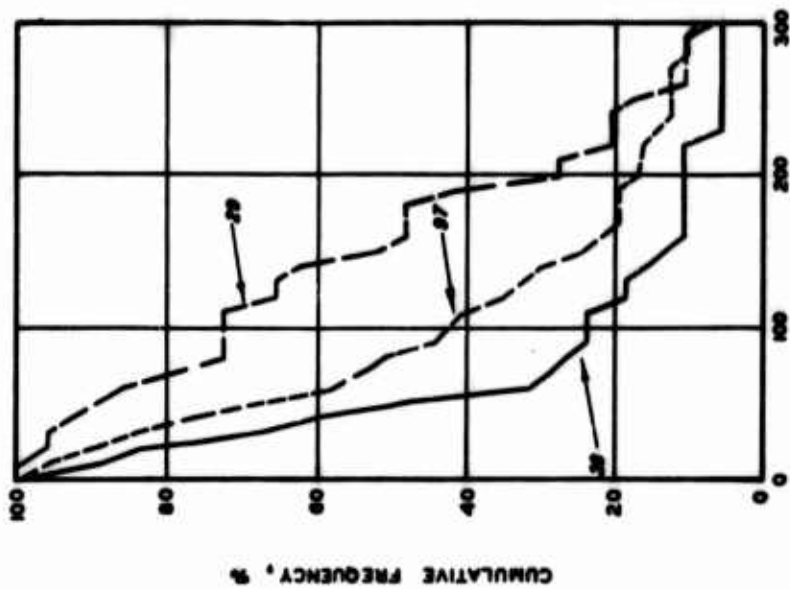
\* SAMPLE INTERPRETATION: 50% OF SAMPLES OCCURRED AT RATING CONE INDEX OF 115 OR HIGHER.



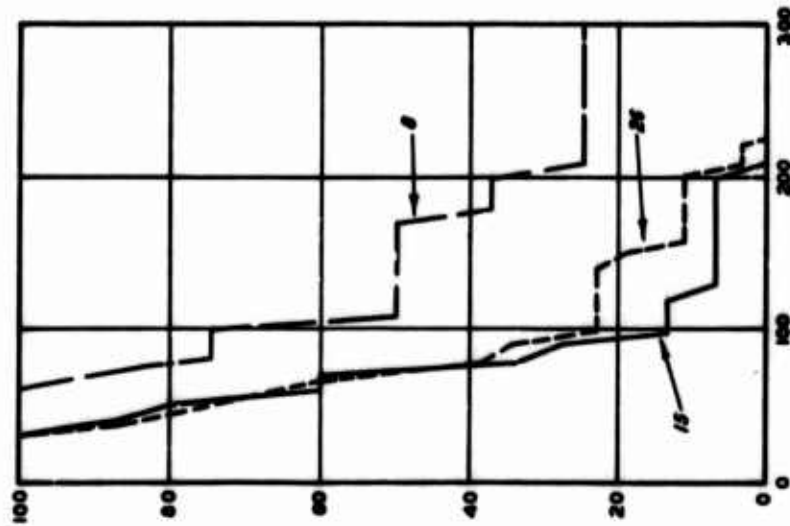
**LOAMY SOILS**

**CUMULATIVE FREQUENCY OF RATING CONE INDEX**

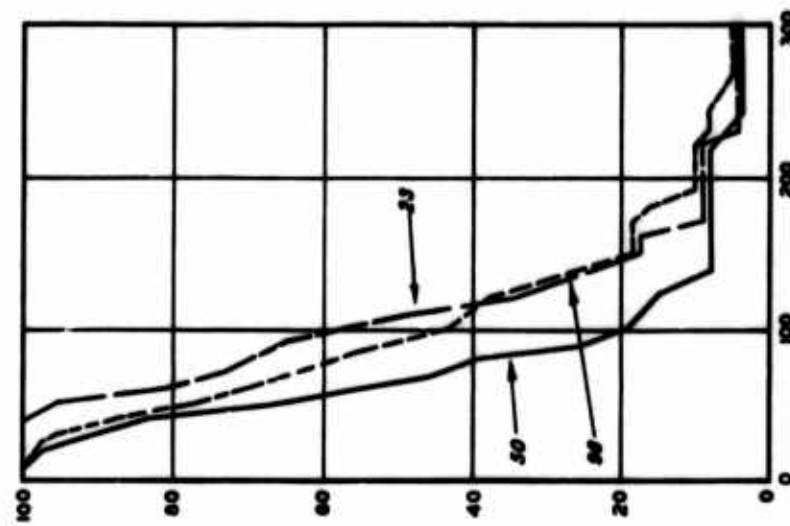
USDA SOILS  
GRAVELLY SOILS, SAND (FINE), AND LOAMY SAND



SANDY LOAM



SANDY CLAY LOAM



LOAM

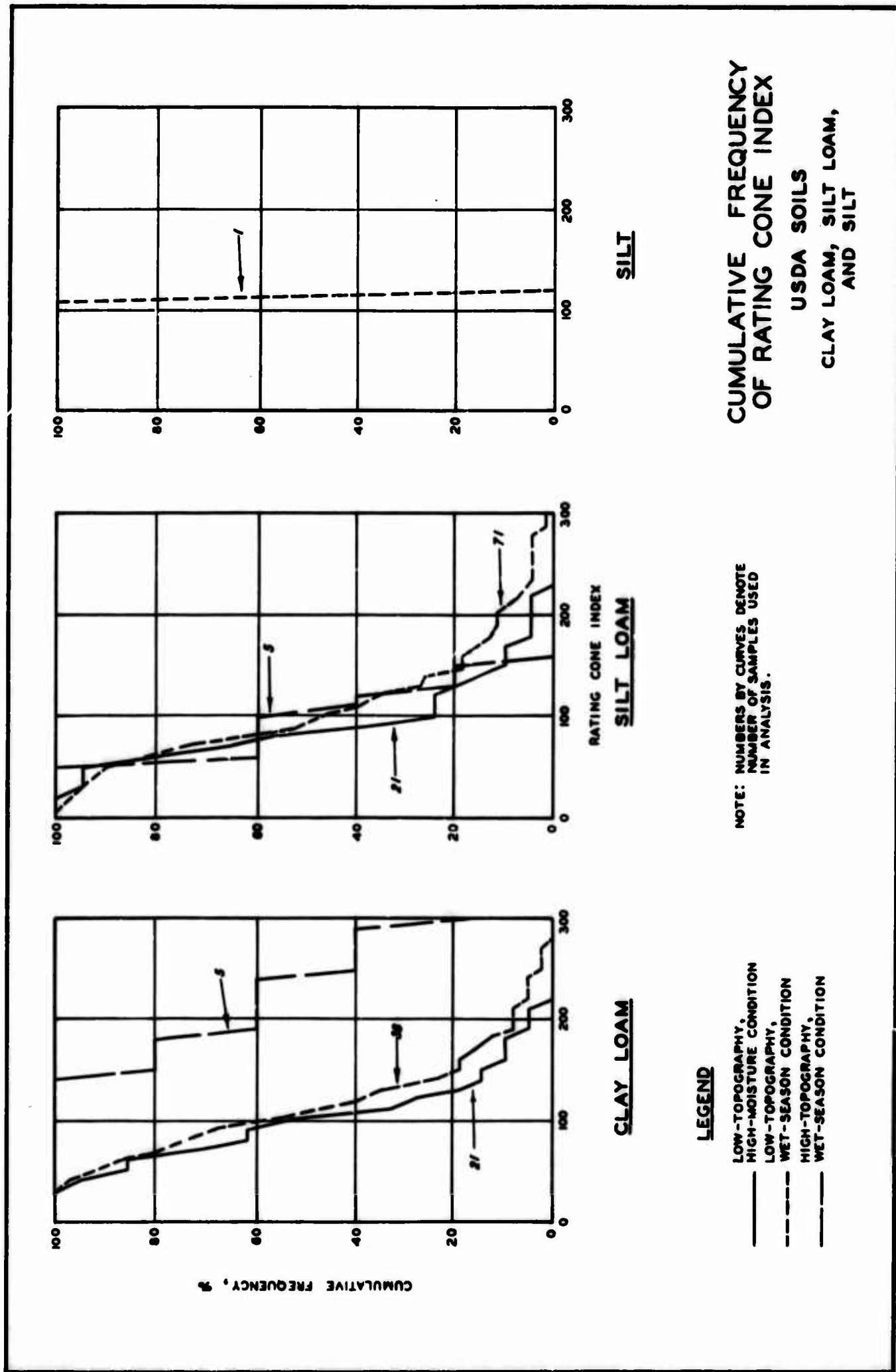
LEGEND

- LOW-MOISTURE CONDITION
- - - LOW-MOISTURE CONDITION
- - - WET-SEASON CONDITION
- WET-SEASON CONDITION

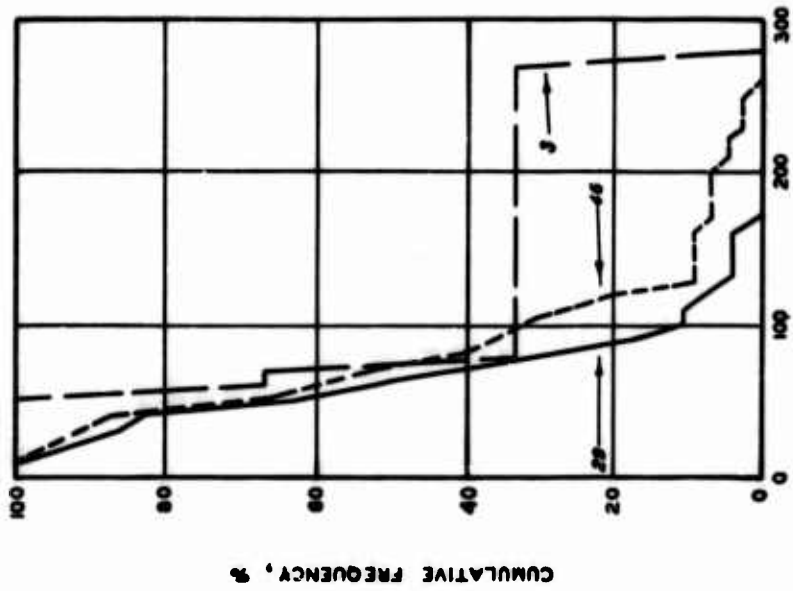
NOTE: NUMBERS BY CURVES DENOTE  
NUMBER OF SAMPLES USED  
IN ANALYSIS.

CUMULATIVE FREQUENCY  
OF RATING CONE INDEX  
USDA SOILS  
SANDY LOAM, SANDY CLAY LOAM,  
AND LOAM

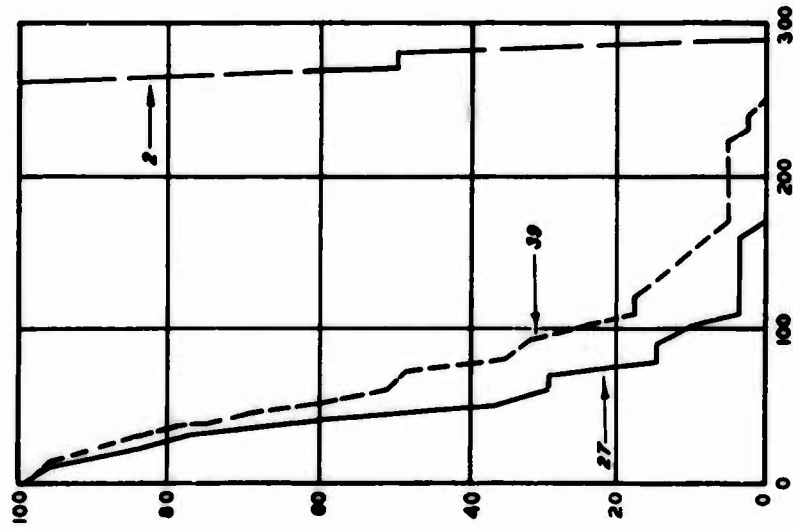
PLATE 8.



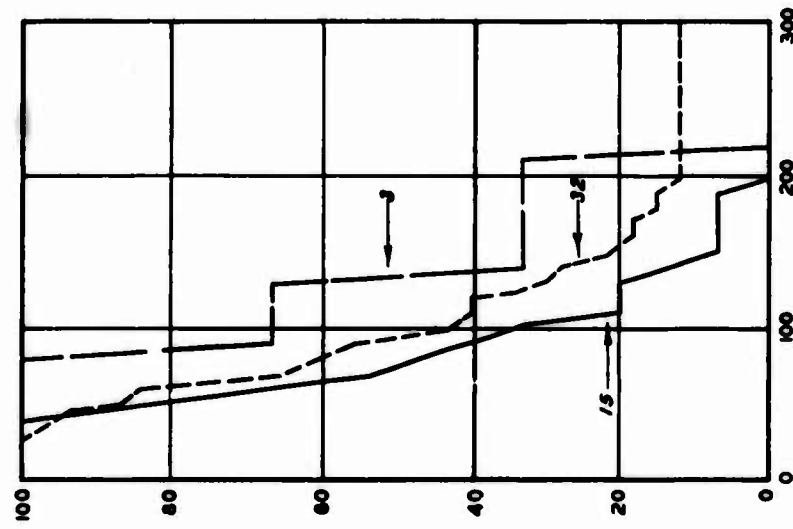




SILTY CLAY LOAM



SILTY CLAY



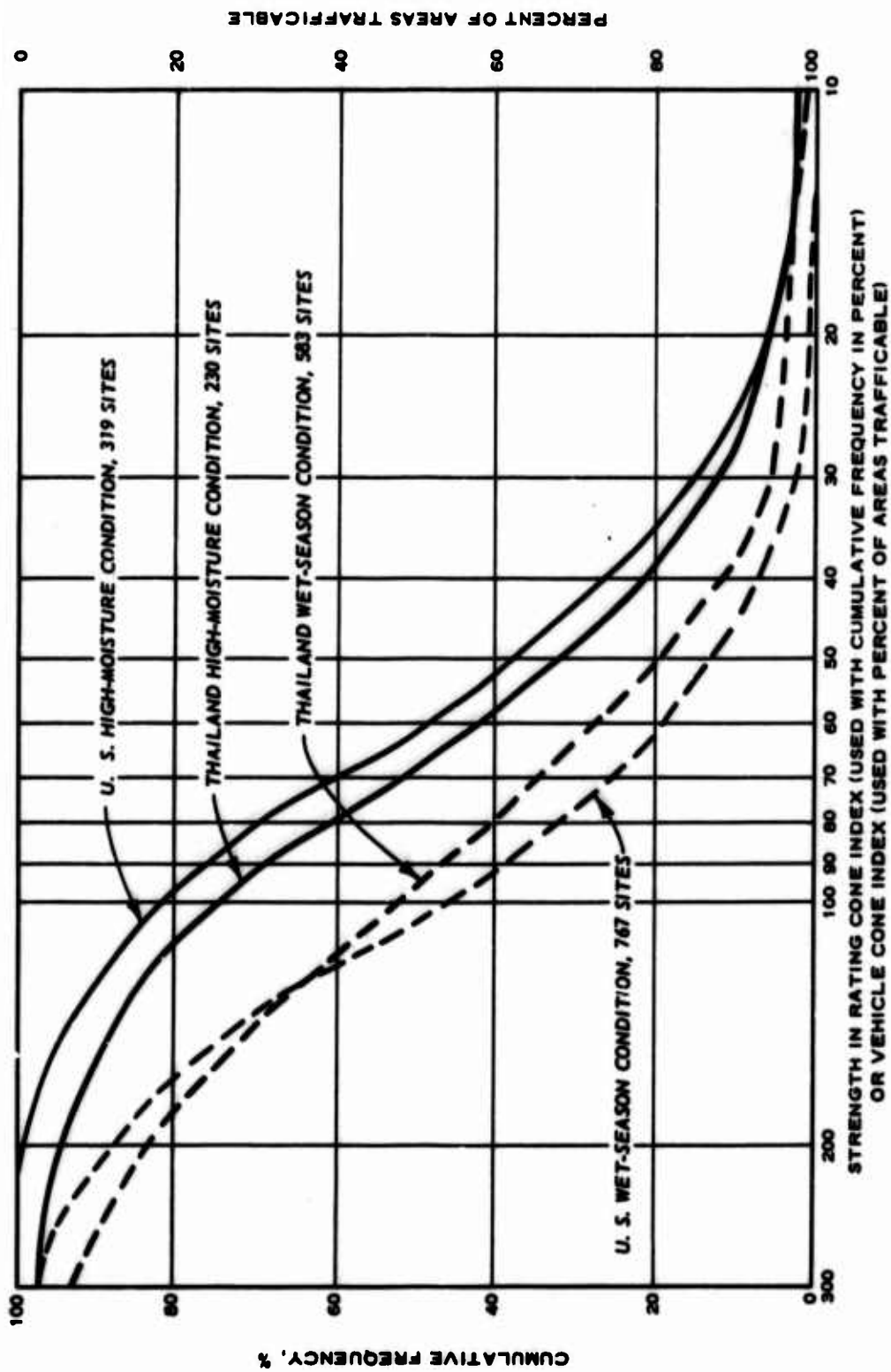
CLAY

- LEGEND
- LOW-TOPOGRAPHY, HIGH-MOISTURE CONDITION
  - - - LOW-TOPOGRAPHY, WET-SEASON CONDITION
  - · · HIGH-TOPOGRAPHY, HIGH-MOISTURE CONDITION
  - · - HIGH-TOPOGRAPHY, WET-SEASON CONDITION

CUMULATIVE FREQUENCY  
OF RATING CONE INDEX

USDA SOILS  
SILTY CLAY LOAM, SILTY CLAY,  
AND CLAY

NOTE: NUMBERS BY CURVES DENOTE  
NUMBER OF SAMPLES USED  
IN ANALYSIS.



NOTE: WET-SEASON CONDITION IS FOR HIGH- AND LOW-TOPOGRAPHY AREAS;  
HIGH-MOISTURE CONDITION IS FOR LOW-TOPOGRAPHY AREAS ONLY.

# CUMULATIVE FREQUENCY OF RATING CONE INDEXES IN UNITED STATES AND THAILAND

FINE-GRAINED SOILS, 6-TO 12-IN. LAYER

## APPENDIX A: SOURCES OF DATA AND DETAILED PROCEDURES USED TO OBTAIN DATA

1. The soil and site data pertinent to the soil trafficability classification analyses are presented in tables A1-A6. These data were obtained in six different programs conducted during the period June 1962 through November 1965 in Thailand. Soil data included are texture, Atterberg limits, USCS and USDA soil type, organic content, and specific gravity. Trafficability data included are moisture content, density, depth to water table, and strength, i.e. cone index (CI), remolding index (RI), rating cone index (RCI), and sheargraph cohesion, adhesion and  $\tan \phi$  values, for wet-season and high-moisture conditions. Site data included are geographic locations furnished on Army Map Service map sheets and military grid coordinates, topographic class, topographic position, slope, vegetation, and land use. The general locations of the sites are shown on a map of Thailand in fig. 4 of the main text.

2. In tables A1-A6, the trafficability data for the wet-season condition are the data obtained during one visit to a site or an average of data for two or more visits during the wet season, as noted in the tables. At some sites the RI and, consequently, the RCI could not be determined on some visits because of the firmness of the soil. In determining an average RCI for a site which was visited two or more times, the CI data used were those for which RI measurements were available. Data for high-moisture conditions (water table 18 in. or less from the surface) for all trafficability parameters except sheargraph are usually for one visit. If this condition occurred on more than one visit, the data presented in the tables and used in the analyses were for the day of lowest RCI. Sheargraph data are listed under the high-moisture condition only when the water table was at the surface or free water was above the surface.

3. The following paragraphs are grouped according to the six sources of data and contain a detailed discussion of sampling techniques, number of visits to a site and number of measurements taken during each visit, number and geographical locations of the sites, and other important features of the test programs relevant to the data for each of the sources.

### Preliminary Survey Study

4. A preliminary study<sup>2</sup> was made in Thailand to provide guidance for a planned, long-range research program to develop new methods and apply existing methods for measuring and predicting in quantitative and semiquantitative terms the effects of environmental factors on ground vehicles operating in Southeast Asia. Data were obtained from 202 sites visited during the period June-October 1962 by a team of specialist engineers, physical scientists, and technicians. The test sites were concentrated primarily in four geographic areas: the lower Chao Phraya Delta, the Bangkok Plain, the Khorat Plateau in south-central and eastern Thailand, and the Chiang Mai Basin in northwest Thailand. Also, some of the sites visited were located in the southeastern coastal plain. One visit was made to each site. The data collected for the preliminary survey study from 165 sites that are pertinent to this trafficability classification study are presented in table A1.

#### Soil and trafficability data

5. At each test site, 10 CI penetrations were made in an area approximately 10 by 20 ft. For each penetration, CI was measured at the surface and at 3-in. vertical increments to a depth of 18 in., and then at 6-in. vertical increments to a depth of 30 in., when possible. When soil conditions permitted testing, RI was measured at each site for the 0- to 6- and 6- to 12-in. layers. In some instances remolding index was measured for the 12- to 18-in. layer. Soil samples were taken for moisture content-density determinations for the same soil layers mentioned above. Representative bulk samples were taken from the 0- to 6- and 6- to 12-in. layers and occasionally from the 12- to 18-in. layer for laboratory tests. Samples were taken in an area approximately 1 ft square.

#### Site data

6. The site data obtained included geographic location of the test site, topographic position, slope, land use, vegetation, depth of soil, surface-water depth, and depth to water table. An attempt was made to sample a wide range of conditions and soil types with emphasis on testing the lowest and wettest areas on the assumption that the test results would



give some insight into the maximum moisture contents and minimum strengths that various soil types would exhibit during the peak of the wet season.

#### Trafficability Classification Study

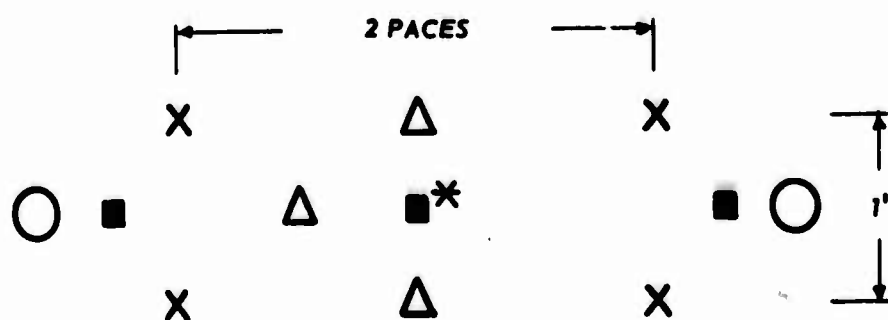
7. Data collected for the trafficability classification study were obtained from 246 sites visited during the period August-October 1964 by a WES soil-trafficability team whose objective was to provide data specifically for the study reported herein. The sites were located within six MERS study areas: Nakhon Sawan, Lop Buri, Chiang Mai, Khon Kaen, Pran Buri, and Chanthaburi. In general, the rainy season extends from May to September in the northern area, from May to October in the central area, and from May to November in the south-central area of Thailand; hence, the period of testing coincided with the expected period of high soil-moisture content during the wettest monsoon season. One visit was made to each site. The data from 238 sites are presented in table A2.

#### Soil and trafficability data

8. The strength data at each site were obtained as follows. Four sets of CI profiles were taken with measurements taken at the surface and at 3-in. vertical increments to a depth of 18 in.; RI tests were run on two or occasionally three samples from the 6- to 12-in. layer, and surface sheargraph measurements were made at three different locations on the site. Soil samples were taken from the 0- to 6- and 6- to 12-in. layers with the trafficability sampler for determination of moisture content, density, grain-size distribution, Atterberg limits, organic content, and specific gravity. When the soil was too firm for sampling with the trafficability sampler, samples were secured with an Oakfield punch or with a shovel. The locations of test or sampling points for each site are shown in fig. A1.

#### Site data

9. In each area sites were selected to include a range of different soil types, topographic positions, land uses, and vegetation types with emphasis on the collection of data for soil type-topographic positions for which little or no data had previously been collected, e.g. moderately and highly organic soils on all topographic positions, all soils on upland



- X CONE INDEX
- REMOLDING INDEX
- \* REMOLDING INDEX (OPTIONAL)
- MOISTURE-DENSITY AND BULK SAMPLES
- △ SHEARGRAPH

Fig. A1. Site layout

depressions and ridges, and clayey sands, silts, and clays on upland flats. A special effort was made to include an equal number of sites in each combination of soil type and topographic position.

10. Land use at each site was described in one or more of the following terms:

- a. Undisturbed; not obviously used by man or domestic animals.
- b. Disturbed; obviously used by man or domestic animals.
  - (1) Cropland currently in use (excluding hayfields, orchards, vineyards, tree plantations). Type \_\_\_\_\_.
  - (2) Cropland currently lying fallow (excluding hayfields, orchards, vineyards, tree plantations). Type \_\_\_\_\_.
  - (3) Pasture grazed by domestic animals.
  - (4) Hayfields (not currently being grazed).
  - (5) Orchards, vineyards, tree plantations. Type \_\_\_\_\_.
  - (6) Lawns, recreation areas.
  - (7) Logged, cut for fuel, newly cleared for slash-and-burn agriculture.

11. Since the essence of this program lay in securing a wide range of soil types and topographic position data during the high-moisture period of the wettest monsoon season, no attempt was made to collect detailed vegetation data; instead, the vegetation was described in general but consistent terms that could be readily identified even by relatively untrained observers. These terms are:

- a. Forest. Trees more than 5 m (approximately 16 ft) tall with the crowns of the trees covering more than 90% of the area. Only the trees are significant; smaller plants are ignored.
- b. Woodland. Trees more than 5 m (approximately 16 ft) tall with the crowns of the trees covering between 40 and 90% of the area.
- c. Savanna. Trees more than 5 m (approximately 16 ft) tall with the crowns of the trees covering from 5 to 40% of the area. The "ground cover" may be wild grass, rice, maize, or any mostly herbaceous plants.
- d. Tall scrub forest. Trees from 1.8 (approximately 6 ft) to 5 m (approximately 16 ft) tall with the crowns covering more than 90% of the area.
- e. Tall scrub woodland. Trees from 1.8 (approximately 6 ft) to 5 m (approximately 16 ft) tall with the crowns covering 40 to 90% of the area.
- f. Tall scrub savanna. Trees from 1.8 (approximately 6 ft) to 5 m (approximately 16 ft) tall with crowns covering from 5 to 40% of the area.
- g. Low scrub. Shrubs from 0.7 (approximately 2.3 ft) to 1.8 m (approximately 6 ft) tall with the crowns covering more than 40% of the area.
- h. Low scrub savanna. Shrubs from 0.7 (approximately 2.3 ft) to 1.8 m (approximately 6 ft) tall with the crowns covering from 5 to 40% of the area.
- i. Tall-grass prairie. Herbaceous plants, usually of mostly grasses or grasslike plants, more than 0.7 m (approximately 2.3 ft) high with the plants covering more than 50% of the ground surface.
- j. Short-grass prairie. Herbaceous plants, usually of mostly grasses or grasslike plants, less than 0.7 m (approximately 2.3 ft) high with the plants covering more than 50% of the ground surface.
- k. Barren. More than 50% of the ground surface is bare, i.e. not covered by plants.

In the definitions listed above no distinction is made between cultivated

and noncultivated plants. Thus, a coconut plantation, a rubber grove, or an orchard is usually a "forest" or a "woodland" and a field of mature rice is a "tall-grass prairie."

12. Topographic slope was measured with an Abney hand level at each site on the contiguous area over which no change in true slope occurred. Topographic position was identified as one of the following:

- a. Upland flat (UF)
- b. Upland depression (UD)
- c. Upland ridge (UR)
- d. Upper slope (US)
- e. Lower slope (LS)
- f. Terrace flat (T)
- g. Terrace slope (TS)
- h. Bottomland flat (BF)
- i. Bottomland depression (BD)
- j. Natural levee (NL)
- k. Stream bottom (SB)
- l. Tidal flat (TF)
- m. Drainage ditch (DD)
- n. Beach (B)

Other data collected included depth of water over soil surface, depth to ground water, and depth to bedrock if within several feet of the surface.

#### Surface Composition Study

13. The objective of the surface composition study<sup>3</sup> was to secure data for establishing the range in variation of areal and seasonal soil strength in Thailand and for mapping soils exhibiting similar trafficability characteristics in selected study areas in Thailand. These data were obtained during the period April 1964 through June 1965 by a soil trafficability team. The study areas and the number of visits to sites in each area are shown in the following tabulation.



<u>Area</u>	<u>No. of Visits to Site</u>
Nakhon Sawan	2
Lop Buri	3
Chiang Mai	2
Pran Buri	1
Khon Kaen	2
Chanthaburi	1

The data collected for the surface composition study from 224 sites that are pertinent to the trafficability classification study are presented in table A3.

#### Soil and trafficability data

14. At each site, soil-strength data were collected for CI, RI, and sheargraph tests. Four or more CI profiles were obtained. Measurements for each profile were made at 1-in. vertical increments to a depth of 18 in. RI tests were conducted on samples from the 0- to 6- and 6- to 12-in. layers. If the results of the tests on two samples from each layer were not in close agreement, a third RI test was made. Sheargraph tests were performed on the soil surface at only one point on the site. Soil samples were taken with the trafficability sampler in 3-in. increments to a depth of 12 in. for the determination of moisture content and density. Bulk samples were taken for laboratory determination of grain-size distribution, Atterberg limits, organic content, and specific gravity. At each site a pit was dug and the soil profile was described to a depth of 18 in. Data also were obtained on the color, pH, and reaction to HCl of soil horizons. From these data the soil series were identified.

#### Site data

15. The classification of site data for this study was the same as that used in the trafficability classification study (see paragraphs 10-12 of this appendix).

#### Soil Moisture-Strength Study

16. The objective of the soil moisture-strength study<sup>4</sup> was to develop means for quantitatively predicting soil-moisture contents and

strength of the soil for use in predicting trafficability of the critical soil layer. Data for this study were obtained from 75 sites during the period May 1964-November 1965 by teams of Thai engineers and technicians. Data were collected during two wet seasons and one dry season. Sites were selected to provide a range in climate, topography, soil type, and land use. The sites were located in seven MERS study areas and in the vicinity of Bangkok, Thailand.

17. Two types of sites, prediction-development (PD) and survey (TS), were established. Data from PD sites were used to develop rainfall-soil moisture-strength relations, and data from the TS sites will be used to check the accuracy of soil moisture-strength predictions that were based on the relations developed from PD site data. Twenty PD and 55 TS sites were established. The PD sites were visited daily to collect unit electrical resistivity data for use in measurement of soil-moisture content, and these sites and the TS sites also were visited one or more times each month to collect trafficability data. The data from this study that are pertinent to the soil trafficability classification study are presented in table A4.

#### Soil and trafficability data

18. Data from the PD and TS sites were collected in a 21- by 36-ft sampling area divided into 3-ft-square plots. Samples and direct measurements of the soil were taken in three randomly selected plots during each sampling visit to the site.

19. Six CI penetrations, two in each of three randomly selected plots, were made on each visit, and measurements of CI were averaged for the 0- to 6- and 6- to 12-in. layers. RI tests were performed on samples of the 6- to 12-in. layer from each of the three plots. Data from the tests were averaged for each visit. The RCI for a specific visit was then tabulated in the usual manner. An attempt was made to obtain strength measurements concurrently with moisture measurements. CI and especially RI data could not be obtained as frequently as moisture data and at some sites could not be obtained at all during the dry season due to firmness of the soil. At some sites flooding prevented data collection for long periods during the wet season.

20. For each visit sheargraph measurements on the soil surface were made at two spots on each of the three selected plots and averaged. For most sites these data were obtained on four visits during the period of testing.

21. Soil samples of the 3-in. soil layers from the surface to a depth of 18 in. were taken with the trafficability sampler for determination of moisture content. Samples were obtained from two spots in each of three plots. The moisture content data were averaged for each 3-in. layer and for the 0- to 6- and 6- to 12-in. layers.

22. When a thin-walled piston type soil sampler could be used to obtain a relatively undisturbed sample of proper length, that sample was saved for moisture content and density determinations. Also, when the soil was moist, two 2-in. cores were taken with the San Dimas or drive-type sampler for determination of density. The density listed in the summary table for each site is the average of density values determined from tests on piston-type soil samples, or where no such samples were obtained, it is the average of the two density values determined from tests on San Dimas soil samples.

23. The USDA and USCS soil types for each site were determined from mechanical analysis and Atterberg limits of bulk samples taken from the 0- to 6- and 6- to 12-in. layers. The sample tested in the laboratory for each layer was a composite of three samples taken at each end and along a point on one side of the site. The bulk soil samples were also tested to determine the organic content and specific gravity of the soil layer.

#### Site data

24. Measurements of rainfall, depth to ground water, and ambient temperature were made daily at each of the PD sites.

25. Data describing the topographic position, slope, land use, and vegetation at a site were collected from observations in the field during the period of study. The systems for classifying topographic position, land use, and slope are the same as those used in the trafficability classification study (see paragraphs 10-12 of this appendix).

U. S. Army Cold Regions Research and Engineering  
Laboratory (CRREL) Airphoto Pattern Study

26. The purpose of the CRREL airphoto pattern study<sup>5</sup> was to develop a method for interpreting, classifying, and mapping terrain features of Thailand from airphotos in terms of their effect on ground mobility. Data were obtained from 191 sites during the period 4 September-18 October 1964 by a team of specialist engineers and physical scientists.

27. The sites were located in two MERS study areas selected for detailed study--Lop Buri and Chanthaburi. The sites were selected primarily on the ability of the analyst to recognize tone and texture on aerial photographs. One visit was made to each site. The data from 121 sites pertinent to the trafficability classification study reported herein are presented in table A5.

Soil and trafficability data

28. Three or more CI penetrations were made at each site. For each penetration, CI generally was measured at 1-in. increments from the surface to a depth of 18 in. RI tests were made on samples from the 6- to 12-in. layer. Samples for determination of moisture content and density were taken with the trafficability sampler in 3-in. vertical increments from the surface to a depth of 12 in. The data were averaged for the 0- to 6- and 6- to 12-in. layers. (The density values are questionable and are not listed in the table.) When the soil was too firm to be sampled with the trafficability sampler, samples for moisture only were taken with the Oakfield punch. Bulk samples for determination of grain size, Atterberg limits, organic content, and specific gravity were taken from the 0- to 6- and 6- to 12-in. layers. The soil profile was described briefly in pedological terms.

Site data

29. The topography class, topographic position, and land use identification for each site were based on a general description or were interpreted from aerial or ground photographs of the site.



### Terrain-Vehicle Tests

30. The terrain-vehicle test program<sup>6</sup> was conducted to verify a mathematical model of cross-country vehicle performance previously developed in the United States, by applying it to tropical terrains and modifying it as required. Data for the program were collected in traffic test courses during the period September through October 1965 by a team of engineers, physical scientists, and technicians. The test courses ranged from 10 to 20 ft (hydrologic geometry, designated HG, test courses), to several hundred feet (surface geometry, designated SG, and multiple, designated M, test courses), to several thousand feet (cross-country, designated CC, test courses) in length. For purposes of this study, each of the HG, SG, and M test courses was designated as a site. Each of the CC test courses was subdivided into two or more short stretches, based on changes in soil type, topography, and land use. These stretches were also designated as sites; e.g., test course CC2 was subdivided into sites CC2-A, -B, and -C. The data used in this report are from 23 sites located in the MERS study area of Khon Kaen. Data from the vehicle test program pertinent to the trafficability classification study are presented in table A6.

#### Soil and trafficability data

31. The data in the table for each site are average values for the total number of visits. On each visit 10 or more CI penetrations were made. For each penetration, CI was measured at the surface, at depths of 1 in. and 3 in., and then at 3-in. vertical increments to 24 or 30 in. Several RI tests were made on samples from the 0- to 6- and 6- to 12-in. layers. Sheargraph measurements of the soil surface were taken in one small area. One set of samples per visit was obtained from the 0- to 1/4- and 0- to 1-in. soil layers for determination of moisture content, and another set of samples was obtained from the 0- to 6- and 6- to 12-in. layers for determination of moisture content and density. Bulk samples for determination of grain size, Atterberg limits, and specific gravity were obtained from the 0- to 6- and 6- to 12-in. layers.

Site data

32. Geographic location, topography class, topographic position, slope, land use, and vegetation data were obtained from general terrain information secured in the field. Again, these data, as tabulated, represent average conditions of the test area.

**Tables A1-A6**

Table A1  
Preliminary Survey Study  
Summary of Site, Soil, and Trafficability Data

Section A. Site Data								Section B. Soil Data												
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				By Wt %	USCS				Type	Or- ganic Con- tent %	Spe- cific Grav- ity
Site No.	Map Sheet	Grid Coordi- nates							Texture by Wt. %			Atter- berg Limits								
									Sand	Silt	Clay	Type*		LL	PL	PI				
1	5153III	873521	Low	Bottomland flat	0	Bare	Cultivated	0-6 6-12	-- 12	-- 54	-- 34	-- SicL	-- 92	63 65	27 27	36 38	CH CH	-- --	2.58 2.64	
3	5153IV	811787	Low	Drainage ditch	0	Short grass	Grazed	0-6 6-12	4 7	28 30	68 63	C C	96 93	63 64	32 36	31 28	MH MH	-- --	2.59 2.57	
4	5153IV	811787	Low	Bottomland flat	0	Grass (6 in. high)	Cultivated (idle)	0-6 6-12	4 12	28 18	68 70	C C	97 98	66 65	34 32	32 33	MH CH	-- --	2.48 2.61	
5	5153IV	811787	Low	Bottomland depression	0	Grass (8 in. high)	Cultivated (idle)	0-6 6-12	15 1	14 14	71 85	C C	100 100	72 73	38 34	34 39	MH CH	-- --	2.52 2.55	
8	5253IV	170848	Low	Lower slope	1	Short grass	Cultivated (idle)	0-6 6-12	56 54	19 22	25 24	SCL SCL	63 63	20 25	-- 18	NP 7	ML CL-ML	-- --	2.56 2.61	
9	5153I	105821	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	3 10	72 30	25 60	SicL C	100 94	81 77	65 39	16 38	CH MH	-- --	2.34 2.56	
12	5254I	426187	High	Terrace flat	0	Melons	Cultivated	0-6 6-12	11 7	45 22	44 71	SicC C	92 94	57 54	36 37	21 17	MH MH	-- --	2.60 2.61	
13	5255II	670353	High	Terrace flat	1-2	Brush and trees	Undisturbed	0-6 6-12	28 33	27 22	45 45	C C	78 73	40 44	29 29	11 15	ML ML	-- --	2.64 2.65	
14	5355I	049455	Low	Bottomland flat	1	Short grass	Cultivated (idle)	0-6 6-12	11 15	21 32	68 53	C C	92 92	62 59	34 26	28 33	MH CH	-- --	2.70 2.69	
15	5456III	925612	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	10 6	40 28	50 66	SicC C	93 95	59 62	30 28	29 34	CH CH	2.09 0.95	2.63 2.69	
16	5457II	269981	Low	Terrace flat	0	Short grass	Cultivated (idle)	0-6 6-12	66 62	24 23	10 15	SL SL	49 49	22 22	-- 15	NP 7	SM SM-SC	1.05 --	2.61 2.69	
17	5457II	269989	Low	Terrace flat	0	Short grass	Cultivated (idle)	0-6 6-12	55 55	27 28	18 17	SL SL	57 55	38 29	15 13	23 16	CL CL	-- --	2.58 2.69	
18	5457II	268989	Low	Bottomland depression	0	Short grass	Cultivated (idle)	0-6 6-12	57 53	27 26	16 21	SL GSCL	62 47	25 26	15 21	10 5	CL SM-SC	-- --	2.61 2.73	
19	5558II	623412	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	47 42	33 31	20 27	L L	65 70	36 36	19 18	17 18	CL CL	0.78 --	2.71 2.71	
20	5558IV	499639	High	Upper slope	1	Trees and brush	Undisturbed	0-6 6-12	85 86	12 12	3 2	LS LS	24 23	-- 17	-- 16	NP 1	SM SM	-- --	2.61 2.65	
21	5559II	771755	Low	Stream bottom	0	Short grass	Grazed	0-6 6-12	92 93	6 5	2 2	S S	17 13	-- 20	-- NP	NP SM	SM SM	-- --	2.63 2.66	
22	5747IV	551305	High	Upland flat	2	Brush and trees	Undisturbed	0-6 6-12	81 83	17 15	2 2	LS LS	35 34	-- 17	-- NP	NP SM	SM SM	-- --	2.57 2.64	
23	5757IV	590290	Low	Bottomland flat	0	Marsh grass	Grazed	0-6 6-12	73 80	22 17	5 3	SL LS	46 42	-- 18	-- NP	NP SM	SM SM	-- --	2.62 2.65	
24	5754IV	387080	High	Terrace flat	1	Tall trees and bamboo grass	Undisturbed	0-6 6-12	51 25	34 51	15 24	L SicL	73 92	24 27	-- 19	NP 8	ML CL	-- --	2.59 2.62	
25	5754III	610967	High	Upland flat	1	Trees	Undisturbed	0-6 6-12	72 72	7 6	21 22	SCL SCL	36 37	18 20	-- 15	NP 5	SM SM-SC	0.46 --	2.61 2.60	
26	5754III	550980	Low	Bottomland flat	0	Tall trees	Undisturbed	0-6 6-12	87 82	13 15	0 3	S LS	19 21	-- 16	-- 16	NP 0	SM SM	-- --	2.55 2.65	
28	5754IV	400140	Low	Bottomland flat	0	Open trees with some grass	Cultivated (idle)	0-6 6-12	67 71	19 22	14 7	SL SL	37 38	-- 18	-- NP	NP SM	SM SM	0.42 0.32	2.60 2.61	
29	5754IV	329150	Low	Bottomland flat	0	Scattered trees	Cultivated	0-6 6-12	71 52	21 33	8 15	SL L	50 53	14 14	-- NP	NP ML	SM ML	0.46 0.42	2.63 2.62	
30	5956II	920655	Low	Bottomland depression	0	Rice	Cultivated	0-6 6-12	51 71	29 13	20 16	L SL	68 55	18 19	-- NP	NP ML	ML ML	1.55 1.24	2.62 2.65	
31	5956II	923659	Low	Natural levee	0	Heavy brush with some trees	Undisturbed	0-6 6-12	73 62	6 16	21 22	SCL SCL	40 62	-- --	-- NP	NP ML	SM ML	1.08 0.42	2.56 2.62	
32	5956II	915672	Low	Upper slope	1	Sparse grass with some trees	Cultivated (idle)	0-6 6-12	82 91	11 8	7 1	LS S	30 25	-- --	-- NP	NP SM	SM SM	0.38 0.36	2.63 2.58	
34	5956I	858858	Low	Bottomland depression	1	Short grass	Grazed	0-6 6-12	71 67	23 24	6 9	SL SL	38 41	-- --	-- NP	NP SM	SM SM	0.62 0.58	2.63 2.59	
37	5958IV	603647	High	Upper slope	1	Open forest/brush and short grass	Undisturbed	0-6 6-12	62 78	26 15	12 7	SL LS	55 27	-- --	-- NP	NP SM	ML SM	0.70 0.50	2.62 2.62	
38	5960IV	703285	High	Upper slope	3	Short grass	Grazed	0-6 6-12	89 89	6 5	5 6	S S	18 18	-- --	-- NP	NP SM	SM SM	1.29 0.58	2.61 2.64	

(Continued)

\* G = gravelly, VG = very gravelly.

(1 of 12 sheets)



Table A1 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph**				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph**				Depth to Water Table† in.
								c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\alpha_{ur}$						c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\alpha_{ur}$	
1	1	0-6 6-12	68.0 84.2	52.2 35.4	21 93	1.00 0.78	21 73					68.0 84.2	52.2 35.4	21 93	1.00 0.78	21 73					+2
3	1	0-6 6-12	69.0 70.6	51.8 47.8	52 73	0.72 0.72	37 53					69.0 70.6	51.8 47.8	52 73	0.72 0.72	37 53					6
4	1	0-6 6-12	72.0 75.2	38.0 36.6	85 100	1.27 0.91	108 91					72.0 75.2	38.0 36.6	85 100	1.27 0.91	108 91					18
5	1	0-6 6-12	65.8 80.5	54.5 37.0	44 75	0.91 0.65	40 49					65.8 80.5	54.5 37.0	44 75	0.91 0.65	40 49					+3
8	1	0-6 6-12	92.4 98.9	19.5 19.8	136 162	0.63 0.88	86 143														
9	1	0-6 6-12	58.4 78.3	51.8 34.9	152 193	-- --	-- --														
12	1	0-6 6-12	70.5 --	35.0 24.8	68 222+	0.90 --	61 --														
13	1	0-6 6-12	-- --	16.0 14.2	233+ --	-- --	-- --														
14	1	0-6 6-12	89.6 --	29.9 27.4	55 88	0.90 0.76	50 67					89.6 --	29.9 27.4	55 88	0.90 0.76	50 67					18
15	1	0-6 6-12	-- --	22.2 --	285 220	-- --	-- --														
16	1	0-6 6-12	-- 108.6	15.9 13.4	144 187	0.83 0.66	120 123														
17	1	0-6 6-12	97.6 108.9	20.6 18.8	47 106	0.63 0.85	30 90														
18	1	0-6 6-12	106.1 107.9	18.4 18.2	89 150	0.60 0.77	53 116														
19	1	0-6 6-12	96.4 110.2	19.8 17.9	24 78	0.52 0.74	12 58					96.4 110.2	19.8 17.9	24 78	0.52 0.74	12 58					+2
20	1	0-6 6-12	93.2 --	5.0 --	231 305	-- --	-- --														
21	1	0-6 6-12	-- 93.6	-- 13.8	104 258	-- --	-- --					-- 93.6	-- 13.8	104 258	-- --	-- --					10
22	1	0-6 6-12	100.4 --	9.6 --	490 727	-- --	-- --														
23	1	0-6 6-12	103.3 98.0	15.4 16.4	277 475	-- --	-- --														
24	1	0-6 6-12	89.8 91.8	23.8 24.2	136 98	0.37 0.52	50 51														
25	1	0-6 6-12	93.9 105.2	18.4 17.0	127 145	0.80 0.70	102 102														
26	1	0-6 6-12	89.2 --	9.2 --	108 250	-- --	-- --														
28	1	0-6 6-12	103.2 99.5	14.2 17.5	108 100	0.65 0.26	70 26					103.2 99.5	14.2 17.5	108 100	0.65 0.26	70 26					11
29	1	0-6 6-12	111.0 99.2	14.8 19.5	61 110	0.86 0.36	52 40					111.0 99.2	14.8 19.5	61 110	0.86 0.36	52 40					
30	1	0-6 6-12	93.9 88.0	21.5 20.5	44 78	0.21 0.33	9 26					93.9 88.0	21.5 20.5	44 78	0.21 0.33	9 26					+1
31	1	0-6 6-12	81.1 91.7	12.6 13.8	124 170	-- --	-- --														
32	1	0-6 6-12	94.2 94.0	19.9 19.4	316 582	-- --	-- --														
34	1	0-6 6-12	103.0 104.8	19.9 13.2	215 162	-- 0.62	-- 100														
37	1	0-6 6-12	102.0 96.1	11.3 17.2	243 198	-- 0.82	-- 162														
38	1	0-6 6-12	108.0 111.4	9.2 7.4	194 132	-- --	-- --														

(Continued)

\*\*  $c_u$ , ultimate soil-to-soil cohesion;  $\phi_u$ , ultimate soil-to-soil angle of internal friction;  $a_{ur}$ , ultimate soil-to-rubber adhesion;  $\alpha_{ur}$ , ultimate soil-to-rubber angle of friction.

† Plus (+) denotes depth of water above surface.

(2 of 12 sheets)

Table A1 (Continued)

Section A. Site Data								Section B. Soil Data											
Location			Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Organic Content %	Specific Gravity	
Site No.	Map Sheet	Grid Coordinates							Texture by Wt, %				Atter-berg Limits						
									Sand	Silt	Clay	Type	By Wt % Fines	LL	PL	PI			Type
39	5960IV	700348	Low	Terrace flat	0	Bare	Cultivated	0-6 6-12	51 59	36 30	13 11	L SL	65 56	-- --	-- --	NP NP	ML ML	0.74 0.44	2.63 2.62
40	5960IV	660420	High	Upland flat	0.5	Tall weeds with scattered trees	Cultivated (idle)	0-6 6-12	68 70	11 19	21 11	SCL SL	45 42	-- --	-- --	NP NP	SM SM	1.46 0.95	2.61 2.65
41	5960IV	655415	High	Lower slope	1	Trees	Undisturbed	0-6 6-12	82 --	18 --	0 --	VGLS --	13 --	-- --	-- --	NP --	SM --	1.15 --	2.76 --
42	5962III	698832	High	Upper slope	2	Scattered trees	Undisturbed	0-6 6-12	72 73	12 14	16 13	SL GLS	31 29	-- --	-- --	NP NP	SM SM	0.90 1.00	2.64 2.60
43	5963III	614180	High	Upland flat	0	Heavy tree growth	Undisturbed	0-6 6-12	50 51	29 18	21 31	GL VGSL	37 23	39 52	27 32	12 20	SM SM	2.20 1.05	3.14 3.17
44	5963III	590171	Low	Bottomland flat	0	Low brush and scattered trees	Cultivated (idle)	0-6 6-12	35 20	46 47	19 33	L S1CL	81 85	38 48	26 24	12 24	ML CL	2.87 0.96	2.64 2.69
45	5862I	391151	High	Upland flat	0.5	Short grass and scattered trees	Cultivated (idle)	0-6 6-12	45 39	38 28	17 33	L VGCL	91 13	16 17	-- --	NP NP	ML GM	2.01 1.29	2.58 2.91
47	5763III	640201	High	Upland flat	0	Trees	Undisturbed	0-6 6-12	69 60	24 31	7 9	SL SL	47 47	-- 4	-- --	NP NP	SM SM	0.38 0.25	2.53 2.53
49	5763III	640220	Low	Terrace flat	0	Rice	Cultivated	0-6 6-12	54 56	37 41	9 3	SL SL	60 70	-- 17	-- 17	NP 0	ML ML	0.50 0.44	2.61 2.63
50	5763III	505279	Low	Terrace flat	0	Bare	Cultivated	0-6 6-12	46 25	32 24	22 51	L C	85 90	17 35	-- 21	NP 14	ML CL	0.58 0.62	2.55 2.55
51	5563II	683239	Low	Terrace flat	0	Short grass	Cultivated (idle)	0-6 6-12	72 43	20 28	8 29	SL CL	53 62	-- 17	-- --	NP NP	ML ML	0.46 0.39	2.58 2.58
52	5462I	312063	High	Lower slope	15	Scattered trees and tall grass	Undisturbed	0-6 6-12	82 60	8 26	10 14	LS SL	50 50	-- 22	-- 17	NP 5	SM SH-SC	0.86 0.55	2.53 2.68
53	5462I	326070	High	Lower slope	7	Bamboo with scattered trees	Undisturbed	0-6 6-12	45 46	19 16	36 38	CL SC	55 55	22 23	-- --	NP NP	ML ML	1.55 1.15	-- --
54	5563II	683239	Low	Terrace flat	0	Short grass	Cultivated (idle)	0-6 6-12	72 44	20 28	8 30	SL CL	53 62	-- 17	-- --	NP NP	ML ML	0.46 0.39	-- --
55	5561II	661493	High	Upland flat	1	Trees and brush	Undisturbed	0-6 6-12	94 82	6 14	0 4	S LS	28 30	-- 20	-- 19	NP 1	SM SM	0.32 0.25	2.62 2.62
56	5560II	696228	High	Upper slope	1	Brush and trees	Undisturbed	0-6 6-12	87 71	13 22	0 7	S SL	35 38	-- 13	-- 13	NP 0	SM SM	0.74 0.62	2.59 2.66
57	5458II	142367	High	Upper slope	3	Short grass	Cultivated (idle)	0-6 6-12	82 80	14 17	4 3	LS LS	28 28	20 20	-- 18	NP 2	SM SM	0.70 0.42	2.64 2.62
58	5358II	204341	Low	Bottomland flat	0	Bare	Cultivated	0-6 6-12	100 74	0 9	0 17	S SL	32 42	-- 22	-- --	NP NP	SM SM	1.77 0.70	2.61 2.64
59	5357II	033062	High	Upper slope	1	Short grass	Lawn	0-6 6-12	100 71	0 17	0 12	S SL	34 38	-- 18	-- --	NP NP	SM SM	0.88 0.70	2.62 2.62
60	5156II	001670	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	40 32	30 45	30 23	C C	66 70	50 68	19 26	31 42	CH CH	0.88 0.46	2.57 2.56
62	5151IV	770977	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	9 7	37 36	54 57	C C	92 95	-- 68	-- 28	-- 40	-- CL	0.38 0.32	-- 2.72
63	5151IV	770977	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	6 8	36 34	58 58	C C	96 93	-- 72	-- 30	-- 42	-- CH	0.32 0.84	-- 2.74
66	5154II	061031	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	39 42	49 45	12 13	L L	67 64	-- 18	-- 14	-- 4	-- CL-ML	0.58 0.38	-- 2.65
67	5151IV	795940	Low	Bottomland flat	0	Brush	Grazed	0-6 6-12	9 6	39 47	52 47	C S1C	97 97	-- 79	-- 25	-- 54	-- CH	1.82 1.72	-- 2.75
68	5151IV	795940	Low	Bottomland flat	0	Brush and short grass	Grazed	0-6 6-12	17 5	43 48	45 47	S1C S1C	91 97	70 69	32 30	38 39	CH CH	2.22 2.80	-- 2.72
69	5151IV	795940	Low	Bottomland flat	0	Brush and short grass	Grazed	0-6 6-12	5 4	56 46	39 50	S1CL S1C	97 97	86 97	34 36	52 61	CH CH	3.87 3.58	-- 2.73
70	5150II	087445	High	Terrace flat	0	Recently cleared of trees	Fruit plantation	0-6 6-12	76 75	18 17	6 8	SL SL	28 29	-- 11	-- --	-- NP	-- SM	-- --	-- --
71	5248I	530000	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	73 75	9 5	18 20	SL SL	32 27	-- 23	-- 15	-- 8	-- SC	1.35 1.20	-- 2.64
73	5248I	635955	Low	Beach	0.5	Bare	Undisturbed	0-6 6-12	96 94	2 3	2 3	S S	20 20	-- 27	-- --	-- NP	-- SM	0.22 0.25	-- 2.68
74	5449III	973040	Low	Terrace flat	0	Short grass	Grazed	0-6 6-12	45 52	52 37	3 11	S1L SL	70 58	17 14	17 14	0 0	ML ML	2.91 0.84	-- 2.64
75	5449III	945008	High	Upper slope	6	Rubber plantation	Cultivated	0-6 6-12	64 62	19 12	17 26	SL SCL	40 43	34 42	24 20	10 22	SM SC	3.94 2.49	-- 2.64

(Continued)

(3 of 12 sheets)

Table A1 (Continued)

Section C. Trafficability Data																						
Wet-Season Condition													High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Depth to Water Table in.				
				MC, %	CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi	Tan $\phi$ ur		MC, %	CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi	Tan $\phi$ ur
39	1	0-6 6-12	98.9 101.0	19.4 16.0	108 114	-- 0.48	-- 55	98.9 101.0	19.4 16.0	108 114	-- 0.48	-- 55										18
40	1	0-6 6-12	96.1 97.4	11.1 11.6	198 187	-- --	-- --															
41	1	0-6 6-12	-- --	-- --	442+ 750+	-- --	-- --															
42	1	0-6 6-12	102.3 118.2	10.2 10.4	224 266	-- --	-- --															
43	1	0-6 6-12	104.5 --	18.6 --	191 297+	-- --	-- --															
44	1	0-6 6-12	88.0 91.4	26.6 27.9	106 130	0.60 0.87	64 113															
45	1	0-6 6-12	-- 94.6	-- 22.4	104 175	0.28 0.51	29 89	-- 94.6	-- 22.4	104 175	0.28 0.51	29 89										15
47	1	0-6 6-12	96.1 108.6	14.1 9.2	400 489	-- --	-- --															
49	1	0-6 6-12	101.0 102.0	21.8 29.3	94 360	0.93 --	87 --															
50	1	0-6 6-12	99.6 99.6	24.6 19.4	119 172	0.24 --	29 --	99.6 99.6	24.6 19.4	119 172	0.24 --	29 --										1
51	1	0-6 6-12	106.1 111.7	17.5 14.6	209+ 335+	1.12 0.48	234+ 161+															
52	1	0-6 6-12	102.4 117.0	7.6 12.0	486+ 273+	-- --	-- --															
53	1	0-6 6-12	-- --	8.8 8.1	184 272	-- --	-- --															
54	1	0-6 6-12	104.2 110.2	20.6 17.3	242 293	0.78 0.33	189 97	104.2 110.2	20.6 17.3	242 293	0.78 0.33	189 97										+2
55	1	0-6 6-12	94.2 97.0	9.4 7.6	216 255	-- --	-- --															
56	1	0-6 6-12	103.6 98.7	7.2 3.0	336 574	-- --	-- --															
57	1	0-6 6-12	94.6 93.9	9.6 12.8	113 179	-- --	-- --															
58	1	0-6 6-12	-- --	3.7 6.8	750+ --	-- --	-- --	-- --	3.7 6.8	750+ --	-- --	-- --										+3
59	1	0-6 6-12	103.6 105.5	7.6 5.2	184 330+	-- --	-- --															
60	1	0-6 6-12	77.4 73.0	39.8 44.9	40 77	1.16 --	46 --															
62	1	0-6 6-12	77.7 76.2	37.5 38.1	31 61	0.79 0.82	24 50															
63	1	0-6 6-12	79.2 79.0	31.0 31.3	39 67	0.97 0.96	38 64															
66	1	0-6 6-12	100.4 98.0	19.4 19.4	115 167	0.47 0.27	54 45															
67	1	0-6 6-12	85.2 78.0	27.2 30.5	34 37	0.87 0.33	30 12	85.2 78.0	27.2 30.5	34 37	0.87 0.33	30 12										18
68	1	0-6 6-12	76.1 75.5	39.4 42.8	51 58	0.71 0.68	36 39	76.1 75.5	39.4 42.8	51 58	0.71 0.68	36 39										18
69	1	0-6 6-12	56.5 49.6	67.0 82.0	8 8	0.49 0.54	4 4	56.5 49.6	67.0 82.0	8 8	0.49 0.54	4 4										+1
70	1	0-6 6-12	-- --	-- --	210+ --	-- --	-- --															
71	1	0-6 6-12	88.9 99.6	25.4 17.8	61 230+	0.42 0.40	26 92+															
73	1	0-6 6-12	91.1 84.2	30.6 30.8	104 225	1.20 1.88	125 423	91.1 84.2	30.6 30.8	104 225	1.20 1.88	125 423										1
74	1	0-6 6-12	116.7 97.0	23.4 22.8	128 133	1.30 0.11	166 15	116.7 97.0	23.4 22.8	128 133	1.30 0.11	166 15										5
75	1	0-6 6-12	83.6 84.6	30.7 25.9	78 157	0.42 1.11	33 174															

(Continued)

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Table A1 (Continued)

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				ASTM				Type	Or- ganic Con- tent %	Spe- cific Grav- ity
	Map Sheet	Grid Coor- di- nates							Texture by Wt. %			By Wt %	Atter- berg Limits						
									Sand	Silt	Clay		LL	PL	PI				
76	5547IV	310535	Low	Bottomland flat	0	Short grass	Grazed	0-6 6-12	37 40	51 48	12 12	S1L L	88 87	41 30	31 22	10 8	ML CL	4.82 4.80	-- 2.58
77	5448IV	832932	Low	Bottomland flat	0	Marsh grass	Undisturbed	0-6 6-12	53 33	31 42	16 25	SL L	74 72	49 37	34 23	15 14	ML CL	4.44 2.42	-- --
78	5150I	085730	Low	Bottomland flat	0	Mangrove	Undisturbed	0-6 6-12	65 67	26 25	9 8	SL SL	52 54	-- 48	-- 40	-- 8	-- ML	2.22 2.94	-- 2.60
80	4867III	202814	High	Terrace flat	2	Grass, brush, and small trees	Undisturbed	0-6 6-12	53 48	30 30	17 22	SL L	57 62	-- 24	-- 16	-- 8	-- CL	2.12 1.76	-- 2.66
81	4867IV	190832	High	Upland flat	1	Small trees, brush, and grass	Undisturbed	0-6 6-12	74 73	20 20	6 7	SL SL	35 37	-- 16	-- --	-- NP	SM SH	3.00 0.94	-- 2.63
82	4867IV	169837	High	Upper slope	35	Scattered trees and brush	Undisturbed	0-6 6-12	62 58	23 25	15 17	GL GSL	34 42	21 22	17 14	4 8	SM-SC SC	3.44 1.60	-- 2.66
83	4867IV	149863	High	Upper slope	6	Scattered small trees and brush	Undisturbed	0-6 6-12	78 69	7 21	15 10	VGSL VGSL	12 14	-- 21	-- 15	-- 6	SP-SM SM-SC	0.88 1.89	-- 3.31
84	4867IV	129859	Low	Natural levee	0	Garden	Cultivated	0-6 6-12	18 17	54 50	28 33	S1CL S1CL	83 88	-- 40	-- 24	-- 16	-- CL	2.67 3.11	-- 2.65
85	4867IV	129859	Low	Bottomland depression	0	Bare	Cultivated	0-6 6-12	18 26	47 39	35 35	S1CL CL	85 77	42 41	26 24	16 17	ML CL	3.00 1.14	-- 2.70
86	4767I	958948	Low	Bottomland depression	0	Bare	Cultivated	0-6 6-12	25 17	48 43	27 40	CL S1CL	82 88	40 46	24 24	16 22	CL CL	1.66 2.00	-- 2.69
87	4767I	947947	Low	Upper slope	2	Bare	Cultivated	0-6 6-12	17 19	41 41	42 40	S1C S1CL	88 86	-- 51	-- 22	-- 29	-- CH	3.04 1.60	-- 2.66
88	4870IV	213999	Low	Lower slope	0.5	Rice	Cultivated	0-6 6-12	11 7	53 51	36 42	S1CL S1C	94 96	-- 49	-- 26	-- 23	-- CL	6.21 3.30	-- 2.69
89	4870IV	213001	Low	Natural levee	0	Short, heavy grass	Lawn	0-6 6-12	38 44	45 38	17 18	L L	68 64	-- 30	-- 21	-- 9	-- CL	4.80 2.36	-- 2.66
90	4870III	173905	High	Terrace flat	3	Short grass and scattered trees	Grazed	0-6 6-12	36 39	44 43	20 18	L L	72 67	-- 23	-- 13	-- 10	-- CL	3.27 1.60	-- 2.65
91	4869IV	105650	High	Terrace flat	7	Tall grass	Grazed	0-6 6-12	26 25	42 37	32 38	CL CL	83 93	63 63	40 34	23 29	MH MH	6.45 3.14	-- 2.81
92	4869III	007530	High	Upper slope	12	Scattered trees and grass	Undisturbed	0-6 6-12	62 62	25 25	13 13	SL SL	47 47	-- 19	-- 15	-- 4	SM-SC SM-SC	2.41 1.26	-- 2.66
93	4766IV	650465	Low	Bottomland depression	7	Tall grass	Grazed	0-6 6-12	20 36	48 37	32 27	S1CL L	87 75	-- 34	-- 17	-- 17	-- CL	3.55 1.56	-- 2.66
94	4766IV	650465	High	Upper slope	28	Small trees	Undisturbed	0-6 6-12	-- 66	-- 26	-- 8	-- VGSL	-- 15	-- --	-- --	-- NP	-- SM	-- 1.33	-- 2.69
95	4766III	657445	High	Upper slope	2	Small trees and brush	Undisturbed	0-6 6-12	56 52	20 20	24 28	SCL SCL	55 57	-- 30	-- 15	-- 15	-- CL	0.70 0.46	-- 2.67
96	4766I	893574	Low	Bottomland flat	0	Bare	Cultivated	0-6 6-12	28 53	37 29	35 18	CL SL	77 55	33 26	19 15	14 11	CL CL	1.16 0.78	-- 2.63
97	4767II	920680	Low	Terrace flat	1	Short grass	Cultivated (idle)	0-6 6-12	32 53	43 28	25 19	L SL	75 53	33 23	20 16	13 7	CL CL-ML	1.52 0.44	-- 2.67
98	4767II	970780	High	Terrace flat	1	Short grass	Grazed	0-6 6-12	60 53	29 29	11 18	SL SL	47 53	18 19	16 12	2 7	SM CL-ML	0.98 0.54	-- 2.62
99	4767I	970831	High	Upper slope	35	Tall trees and brush	Undisturbed	0-6 6-12	45 35	23 19	32 46	SCL C	58 68	60 57	34 30	26 27	MH MH	5.46 1.76	-- 2.61
100	5455IV	909551	High	Lower slope	1	Bamboo grass	Undisturbed	0-6 6-12	64 60	24 23	12 17	SL SL	44 47	-- 20	-- 13	-- --	-- SM-SC	-- --	-- 2.63
101	5455IV	919337	High	Upper slope	1	Short trees and brush	Undisturbed	0-6 6-12	64 65	28 31	8 4	SL SL	49 53	14 17	14 14	0 3	SM ML	-- --	-- 2.64
102	5455III	943369	High	Lower slope	1-2	Tall trees and bamboo grass	Undisturbed	0-6 6-12	74 70	20 24	6 6	SL SL	43 47	-- 16	-- --	-- NP	SM SM	-- --	-- --
103	5455IV	942468	High	Upper slope	2.5	Tall trees and brush	Undisturbed	0-6 6-12	78 75	15 18	7 7	LS SL	30 32	-- 13	-- --	-- NP	SM SM	-- --	-- 2.64
104	5455IV	929416	Low	Bottomland flat	0	Bamboo and short grass	Undisturbed	0-6 6-12	52 48	30 29	18 23	L L	57 58	-- 26	-- 15	-- 10	-- CL	0.95 0.46	-- 2.64
105	5455III	947340	High	Lower slope	1-2	Tall trees (thick)	Undisturbed	0-6 6-12	72 69	20 22	8 9	SL SL	40 40	13 11	-- --	-- NP	SM SM	-- --	-- --
106	5456II	045705	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	47 48	30 30	23 22	L L	61 60	31 25	13 11	18 14	CL CL	0.54 0.38	-- 2.66
107	5456II	045705	Low	Bottomland flat	0	Bare	Cultivated	0-6 6-12	45 49	33 33	22 18	L L	64 58	21 27	13 11	8 16	CL CL	1.98 0.78	-- 2.64

(Continued)

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Table A1 (Continued)

Section C. Trafficability Data																					
Site No.	No. of Visits	Wet-Season Condition							High-Moisture Condition										Depth to Water Table in.		
		Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				
								c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi	Tan $\phi$ ur						c <sub>u</sub> psi	Tan $\phi$ u		c <sub>ur</sub> psi	Tan $\phi$ ur
76	1	0-6 6-12	73.8 73.4	44.0 42.4	30 61	0.49 0.76	15 46					73.8 73.4	44.0 42.4	30 61	0.49 0.76	15 46					+6
77	1	0-6 6-12	-- --	-- --	167 233	-- --	-- --					-- --	-- --	167 233	-- --	-- --					+2
78	1	0-6 6-12	87.0 72.7	32.0 45.5	34 35	0.50 0.25	17 9					87.0 72.7	32.0 45.5	34 35	0.50 0.25	17 9					
80	1	0-6 6-12	87.6 96.4	20.2 20.1	66 89	0.38 0.53	25 47														
81	1	0-6 6-12	89.2 94.8	17.2 14.0	107 146	-- --	-- --														
82	1	0-6 6-12	107.4 108.6	18.0 15.9	83 103	0.91 0.51	76 53														
83	1	0-6 6-12	121.7 123.2	11.0 10.3	273 301	-- --	-- --														
84	1	0-6 6-12	94.2 98.2	23.4 23.8	63 132	0.40 0.78	25 103														
85	1	0-6 6-12	88.6 100.8	33.3 23.8	8 80	0.52 0.60	4 48					88.6 100.8	33.3 23.8	8 80	0.52 0.60	4 48					+5
86	1	0-6 6-12	79.6 101.4	40.5 23.0	24 117	0.82 0.66	20 77					79.6 101.4	40.5 23.0	24 117	0.82 0.66	20 77					+6
87	1	0-6 6-12	61.8 98.2	55.0 24.1	9 67	0.78 0.75	7 50					61.8 98.2	55.0 24.1	9 67	0.78 0.75	7 50					+6
88	1	0-6 6-12	100.2 98.9	33.4 25.2	35 134	0.56 0.59	20 79					100.2 98.9	33.4 25.2	35 134	0.56 0.59	20 79					+6
89	1	0-6 6-12	81.1 86.4	35.3 31.4	90 94	0.71 0.48	64 45														
90	1	0-6 6-12	100.8 106.1	18.6 16.6	177 139	0.50 0.57	89 79														
91	1	0-6 6-12	80.8 84.2	42.2 36.0	147 184	-- --	-- --														
92	1	0-6 6-12	92.7 103.6	13.5 15.4	190 213	-- 0.92	-- 196														
93	1	0-6 6-12	90.2 101.4	20.4 18.8	133 175	0.76 --	101 --														
94	1	0-6 6-12	-- --	-- --	300+ --	-- --	-- --														
95	1	0-6 6-12	-- --	-- --	132 116	-- --	-- --														
96	1	0-6 6-12	89.8 101.4	28.6 23.6	15 95	-- 0.58	-- 55					89.8 101.4	28.6 23.6	15 95	-- 0.58	-- 55					+4
97	1	0-6 6-12	99.8 101.7	18.7 11.0	127 140	-- --	-- --														
98	1	0-6 6-12	102.4 107.4	13.7 11.8	172 171	-- --	-- --														
99	1	0-6 6-12	68.4 87.0	35.6 30.6	55 118	0.60 0.71	33 84														
100	1	0-6 6-12	93.6 --	12.1 --	219 565+	1.52 --	333 --														
101	1	0-6 6-12	105.2 --	2.6 --	230 571+	1.44 --	331 --														
102	1	0-6 6-12	98.9 --	17.4 --	243+ 663+	-- --	-- --														
103	1	0-6 6-12	-- --	-- --	450+ 750+	-- --	-- --														
104	1	0-6 6-12	96.4 93.0	9.9 4.6	224 425	-- --	-- --														
105	1	0-6 6-12	-- --	-- --	580+ 800+	-- --	-- --														
106	1	0-6 6-12	104.2 116.7	21.9 16.4	64 135	0.68 0.70	44 95					104.2 116.7	21.9 16.4	64 135	0.68 0.70	44 95					+5
107	1	0-6 6-12	105.8 --	24.2 20.8	125 191	0.31 0.62	39 119					105.8 --	24.2 20.8	125 191	0.31 0.62	39 119					+1

(Continued)

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Table A1 (Continued)

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topography Class	Topographic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				UBCS				Organic Content %	Specific Gravity	
	Map Sheet	Grid Coordinates							Texture by Wt. %				By Wt %	Atterberg Limits					
									Sand	Silt	Clay	Type		LL	PL	PI			Type
108	5456II	045705	Low	Bottomland flat	0	Short grass	Grassed	0-6 6-12	62 68	30 15	8 17	SL SL	47 37	13 24	-- --	NP NP	SH SH	0.95 0.38	-- 2.67
111	5151IV	770977	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	9 6	39 34	52 60	C C	92 98	64 65	29 29	35 36	CH CH	1.52 0.96	-- 2.75
112	5151IV	770977	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	11 8	36 42	53 50	C S1C	92 94	62 63	29 31	33 32	CH CH	4.87 2.10	2.77 2.77
113	5151IV	795940	Low	Tidal flat	0	Short weeds	Undisturbed	0-6 6-12	16 16	41 42	43 42	S1C S1C	86 95	86 82	42 38	44 44	OH OH	7.91 9.01	2.72 2.69
114	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	5 7	45 40	50 53	S1C S1C	97 97	71 71	31 34	40 37	CH MH	4.70 4.34	2.73 2.75
118	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	14 10	43 43	43 47	S1C S1C	92 95	91 102	36 35	55 67	OH OH	8.86 8.39	2.69 2.71
119	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	14 10	43 43	43 47	S1C S1C	92 95	91 102	36 35	55 67	CH CH	-- --	2.69 2.71
120	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	9 6	47 47	44 47	S1C S1C	96 96	64 78	30 32	34 46	CH CH	4.05 4.15	2.75 2.75
121	5151IV	795940	Low	Tidal flat	0	Mangrove	Undisturbed	0-6 6-12	6 9	46 54	48 37	S1C S1CL	96 96	88 99	35 34	53 65	OH OH	10.48 8.32	2.71 2.75
122	5151IV	795940	Low	Tidal flat	0	Short weeds	Undisturbed	0-6 6-12	10 6	43 41	47 53	S1C S1C	95 95	82 82	35 33	47 49	OH OH	8.01 --	2.76 2.75
123	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	7 7	46 45	47 48	S1C S1C	96 94	68 77	30 32	38 45	CH CH	2.40 4.60	2.76 2.75
124	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	7 7	46 45	47 48	S1C S1C	96 94	68 77	30 32	38 45	CH CH	-- --	2.76 2.75
125	5151IV	795940	Low	Tidal flat	0	Bare	Undisturbed	0-6 6-12	9 11	39 43	52 46	C S1C	98 93	76 79	34 33	42 46	CH CH	2.48 2.20	2.74 2.73
126A	5556III	328777	High	Upland flat	3.5	Open forest and grass	Undisturbed	0-6 6-12	82 81	13 13	5 6	LS LS	28 28	-- 13	-- 13	-- 0	-- SH	0.95 --	-- 2.63
126B	5556III	331779	High	Lower slope	2	Heavy brush	Undisturbed	0-6 6-12	94 90	4 7	2 3	S S	13 24	-- 17	-- 15	-- 2	-- SH	0.46 --	2.64 --
127	5456I	253863	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	50 48	32 27	18 25	L SCL	59 63	27 30	13 12	14 18	CL CL	1.45 0.86	-- 2.65
128	5456I	231898	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	10 7	30 33	60 60	C C	98 97	-- 82	-- 29	-- 53	-- CH	2.35 1.65	-- 2.67
131	5456I	252950	Low	Lower slope	0	Short grass	Cultivated (idle)	0-6 6-12	81 68	13 14	6 18	CLS GSL	37 38	18 37	18 11	0 26	SH SC	0.78 0.78	-- 2.91
132	5456I	221881	Low	Lower slope	0	Short grass	Cultivated (idle)	0-6 6-12	15 18	38 30	47 52	C C	92 87	50 63	23 23	27 40	CH CH	1.98 1.33	-- 2.66
133	5456I	244940	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	54 42	30 30	16 28	SL CL	58 65	24 43	15 13	9 30	CL CL	1.65 1.15	-- 2.68
135	5457II	258981	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	55 52	28 29	17 19	L SL	58 62	-- 26	-- 13	-- 13	-- CL	0.95 0.62	-- 2.65
136	5457II	289989	High	Lower slope	1	Brush and grass	Undisturbed	0-6 6-12	80 65	13 18	7 17	LS SL	33 43	16 25	-- 13	NP 12	SH SC	0.38 0.55	-- 2.72
137	5457II	299993	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	71 57	15 18	14 25	GSL GSL	40 53	22 39	16 15	6 24	SH-SC CL	0.70 0.55	-- 3.00
138	5557III	319001	Low	Lower slope	1	Short grass	Cultivated (idle)	0-6 6-12	73 76	20 17	7 7	SL LS	40 38	-- 15	-- 15	-- 0	-- SH	0.70 0.55	-- 2.65
142	5557III	346034	Low	Bottomland flat	0	Trees	Undisturbed	0-6 6-12	82 83	15 15	3 2	LS LS	32 28	-- 16	-- 14	-- 2	-- SH	1.55 0.46	-- 2.63
145	5155IV	741409	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	20 21	38 40	42 39	C CL	85 83	-- 60	-- 22	-- 38	-- CH	-- --	-- 2.71
146	5557III	400065	High	Lower slope	1	Grass and brush	Undisturbed	0-6 6-12	18 15	29 27	53 58	C C	88 92	62 68	25 25	37 43	CH CH	-- --	-- 2.64
147	5558II	680349	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	85 78	13 15	2 7	LS LS	30 33	-- 16	-- 14	-- 2	-- SH	0.32 0.32	-- 2.66
148	5557I	680287	Low	Lower slope	1	Grass and weeds	Grassed	0-6 6-12	65 65	27 28	8 7	SL SL	53 53	19 21	18 17	1 4	ML CL-ML	1.33 --	-- 2.66
151	5557I	676296	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	82 83	15 15	3 2	LS LS	32 32	18 18	17 15	1 3	SH SH	0.32 0.32	-- 2.64
154	5557I	679299	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	79 76	18 20	3 4	LS LS	40 43	-- 16	-- 16	-- 0	-- SH	0.25 0.38	-- 2.68

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Table A1 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Depth to Water Table in.
								c <sub>u</sub> psi	Tan $\phi$ u	s <sub>ur</sub> psi	Tan $\alpha$ ur						c <sub>u</sub> psi	Tan $\phi$ u	s <sub>ur</sub> psi	Tan $\alpha$ ur	
108	1	0-6 6-12	108.6 117.6	13.4 14.0	151 193	0.42 0.62	63 120					108.6 117.6	13.4 14.0	151 193	0.42 0.62	63 120					+1
111	1	0-6 6-12	88.6 75.5	37.7 41.7	53 78	0.80 0.89	42 69														
112	1	0-6 6-12	78.0 69.6	39.2 42.0	48 71	0.87 0.83	42 59														
113	1	0-6 6-12	65.8 42.4	57.2 109.8	53 54	0.81 0.81	43 44					65.8 42.4	57.2 109.8	53 54	0.81 0.81	43 44					5
114	1	0-6 6-12	76.4 72.7	42.2 47.2	50 60	0.68 0.70	34 42					76.4 72.7	42.2 47.2	50 60	0.68 0.70	34 42					5
118	1	0-6 6-12	52.1 50.2	75.6 85.7	21 25	0.62 0.56	13 14					52.1 50.2	75.6 85.7	21 25	0.62 0.56	13 14					5
119	1	0-6 6-12	-- --	-- --	26 28	0.62 0.56	16 16					-- --	-- --	26 28	0.62 0.56	16 16					5
120	1	0-6 6-12	79.2 74.0	40.3 46.2	61 54	0.86 0.82	52 44					79.2 74.0	40.3 46.2	61 54	0.86 0.82	52 44					5
121	1	0-6 6-12	49.9 45.2	84.4 98.2	15 23	0.64 0.60	10 14					49.9 45.2	84.4 98.2	15 23	0.64 0.60	10 14					1
122	1	0-6 6-12	63.0 52.8	60.6 75.6	31 36	0.70 0.64	22 23					63.0 52.8	60.6 75.6	31 36	0.70 0.64	22 23					3
123	1	0-6 6-12	75.8 68.0	42.9 52.6	52 56	0.75 0.71	39 40					75.8 68.0	42.9 52.6	52 56	0.75 0.71	39 40					1
124	1	0-6 6-12	-- --	-- --	48 57	0.75 0.71	36 40					-- --	-- --	48 57	0.75 0.71	36 40					1
125	1	0-6 6-12	69.9 64.9	47.8 57.0	38 43	0.57 0.78	22 34					69.9 64.9	47.8 57.0	38 43	0.57 0.78	22 34					1
126A	1	0-6 6-12	100.8 --	9.1 --	109 123	-- --	-- --														
126B	1	0-6 6-12	95.2 --	9.1 --	146 225	-- --	-- --														
127	1	0-6 6-12	109.2 103.6	15.8 16.4	147 185	0.81 --	119 --														
128	1	0-6 6-12	85.2 77.7	33.4 39.5	81 101	1.11 --	90 --														
131	1	0-6 6-12	116.4 112.9	17.2 20.4	184 311	1.52 --	280 --					116.4 112.9	17.2 20.4	184 311	1.52 --	280 --					+3
132	1	0-6 6-12	81.4 --	29.6 32.0	74 115	-- --	-- --					81.4 --	29.6 32.0	74 115	-- --	-- --					+1
133	1	0-6 6-12	94.2 99.8	27.9 22.8	104 263	0.60 --	62 --														
135	1	0-6 6-12	105.2 105.4	19.2 19.4	56 133	0.69 0.83	39 110														
136	1	0-6 6-12	105.8 103.6	12.2 11.8	241 349	-- --	-- --														
137	1	0-6 6-12	103.6 117.3	15.4 15.7	240 371	-- --	-- --														
138	1	0-6 6-12	100.8 105.2	17.7 13.3	206 337	1.58 1.13	325 381														
142	1	0-6 6-12	88.6 89.2	6.8 5.4	146 114	-- --	-- --														
145	1	0-6 6-12	-- --	48.0 46.5	42 79	0.75 0.78	32 62														
146	1	0-6 6-12	-- --	-- --	96 119	-- --	-- --														
147	1	0-6 6-12	-- --	16.9 14.3	135 226	1.16 --	157 --														
148	1	0-6 6-12	103.6 --	22.5 --	130 275+	0.60 0.54	78 149+					103.6 --	22.5 --	130 275+	0.60 0.54	78 149+					+3
151	1	0-6 6-12	103.0 104.6	18.6 17.4	65 145	1.04 0.98	68 142					103.0 104.6	18.6 17.4	65 145	1.04 0.98	68 142					1
154	1	0-6 6-12	95.2 97.6	13.0 16.0	59 130	-- --	-- --					95.2 97.6	13.0 16.0	-- 130	-- --	-- --					+18

(Continued)

(8 of 12 sheets)

Table A1 (Continued)

Section A. Site Data								Section B. Soil Data												
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				By Wt %	USCS				Type	Or-ganic Con-tent %	Spe-cific Grav-ity
	Map Sheet	Grid Coor-di-nates							Texture by Wt. %					Atter-berg Limits						
									Sand	Silt	Clay	Type		LL	PL	PI				
155	5557IV	542170	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	75 75	21 19	4 6	SL LS	38 38	15 16	-- --	NP NP	SH SH	-- --	-- --	
156	5457III	452119	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	76 70	21 17	3 13	LS SL	42 46	17 20	-- 17	NP 3	SH SH	0.32 0.55	-- 2.65	
157	5457III	456119	Low	Lower slope	1	Scattered trees; logged	Cultivated (idle)	0-6 6-12	66 47	30 32	4 21	SL L	55 65	16 31	-- 15	NP 16	ML CL	0.38 0.62	-- 2.66	
158	5457I	238262	High	Upland flat	0	Jute	Cultivated	0-6 6-12	80 80	16 17	4 3	LS LS	33 35	17 18	-- --	NP NP	SH SH	0.55 0.38	-- 2.64	
161	5457I	321201	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	35 43	43 34	22 23	L L	87 72	29 31	19 14	10 17	CL CL	-- --	-- 2.67	
162	5457I	321201	High	Upland flat	0	Short grass	Cultivated (idle)	0-6 6-12	63 67	27 23	10 10	SL SL	77 47	21 21	18 19	3 2	ML SH	1.05 5.32	-- 2.65	
163	5557IV	358201	High	Upland flat	0	Jute	Cultivated	0-6 6-12	72 72	21 22	7 6	SL SL	47 45	20 19	-- --	NP NP	SH SH	1.05 --	-- 2.62	
164	5557IV	357201	Low	Bottomland depression	0	Grass	Undisturbed	0-6 6-12	23 30	54 51	23 19	SIL SIL	87 84	27 26	19 17	8 9	CL CL	0.78 1.45	-- 2.63	
165	5557IV	405198	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	43 32	42 38	15 30	L CL	70 77	23 31	14 14	9 17	CL CL	0.70 1.77	-- 2.67	
166	5557IV	386197	Low	Bottomland flat	0	Grass and brush	Grazed	0-6 6-12	55 41	31 29	14 30	GSL GCL	53 62	20 48	16 18	4 30	CL-ML CL	1.05 0.62	-- 2.82	
167	5557IV	390197	Low	Lower slope	1	Rice	Cultivated	0-6 6-12	35 36	46 42	19 22	L L	75 74	26 30	15 15	11 15	CL CL	0.78 --	-- 2.70	
168	5557IV	492201	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	59 52	33 30	8 18	SL L	57 60	16 24	-- 12	NP 12	ML CL	0.62 0.38	-- 2.68	
170	5154II	143987	High	Lower slope	15	Tall grass	Cultivated (idle)	0-6 6-12	70 65	20 22	10 13	SL GSL	34 28	29 25	17 17	12 8	SC SC	2.21 1.82	-- 2.65	
171	5154II	141980	High	Lower slope	52	Grass and brush	Undisturbed	0-6 6-12	50 56	36 31	14 13	L SL	56 52	27 17	19 16	8 1	CL ML	3.72 2.48	-- 2.67	
172	5154II	120991	Low	Bottomland depression	0	Corn	Cultivated	0-6 6-12	58 63	29 26	13 11	SL SL	46 43	-- 26	-- 21	-- 5	-- SH-SC	2.94 2.42	-- 2.67	
173	5154II	112002	Low	Bottomland flat	0	Fall trees and bamboo	Undisturbed	0-6 6-12	62 60	30 31	8 9	SL SL	47 47	-- 16	-- 14	-- 2	-- SH	2.32 1.33	-- 2.60	
174	5154II	099991	Low	Upper slope	2	Grass and brush	Grazed	0-6 6-12	-- 56	-- 33	-- 11	-- SL	-- 52	28 17	25 17	3 0	ML ML	3.28 1.65	-- 2.61	
175	5154II	076015	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	55 43	37 44	8 13	SL L	52 63	14 18	13 14	1 4	ML CL-ML	1.82 1.45	-- 2.61	
176	5154II	070021	Low	Terrace flat	0	Scattered trees	Cultivated (idle)	0-6 6-12	28 28	61 57	11 15	SIL SIL	78 77	-- 18	-- 16	-- 2	-- ML	3.50 2.42	-- 2.61	
177	5253II	457666	Low	Terrace flat	0	Rice	Cultivated	0-6 6-12	32 30	46 45	22 25	L L	80 82	-- 44	-- 22	-- 22	-- CL	3.14 2.87	-- 2.67	
178	5253IV	421691	Low	Terrace flat	0	Rice	Cultivated	0-6 6-12	7 6	50 36	43 58	SIC C	96 96	48 62	33 29	15 33	ML CH	4.92 5.18	-- 2.63	
179	5253IV	164843	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	23 18	60 59	17 23	SIL SIL	82 86	-- 30	-- 19	-- 11	-- CL	3.91 3.91	-- 2.64	
180	5154III	733862	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	8 5	53 52	39 43	SICL SIC	96 98	-- 61	-- 21	-- 40	-- CH	4.34 3.96	-- 2.71	
181	5254IV	168089	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	21 22	65 57	14 21	SIL SIL	80 82	28 28	24 20	4 8	ML CL	1.98 1.65	-- 2.60	
182	5254IV	167100	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	22 35	42 29	36 36	CL CL	82 82	-- 70	-- 21	-- 49	-- CH	0.78 0.55	-- 2.69	
184	5254IV	160124	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	13 11	54 55	33 34	SICL SICL	92 93	-- 47	-- 22	-- 25	-- CL	3.86 1.33	-- 2.65	
186	5155III	650380	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	13 18	49 43	38 39	SICL SICL	95 93	-- 46	-- 22	-- 24	-- CL	3.27 --	2.69 --	
187	5155III	655380	Low	Bottomland depression	0	Tall trees	Undisturbed	0-6 6-12	5 4	38 38	57 58	C C	97 97	-- 59	-- 27	-- 32	-- CH	2.75 --	-- 2.71	
189	5155III	804351	Low	Bottomland flat	0	Grass	Village	0-6 6-12	38 27	45 46	17 27	SICL L	60 76	49 48	25 25	24 23	CL CL	4.20 --	-- 2.64	
190	5155III	799358	Low	Bottomland flat	0	Short grass	Cultivated (idle)	0-6 6-12	10 --	37 --	53 --	C --	92 --	70 --	30 --	40 --	CH --	3.00 --	2.70 --	
192	5155II	950398	High	Terrace flat	0	Corn	Cultivated	0-6 6-12	25 22	48 45	27 33	L CL	80 83	-- 44	-- 22	-- 22	-- CL	3.86 --	-- --	

(Continued)

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Table A1 (Continued)

Section C. Trafficability Data																	
Wet-Season Condition										High-Moisture Condition							
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	ME, %	CI	RI	NCI	Sheargraph				Depth to Water Table in.
				c <sub>u</sub> psi	Tan $\phi$ u	a <sub>ur</sub> psi	Tan $\alpha$ ur						c <sub>u</sub> psi	Tan $\phi$ u	a <sub>ur</sub> psi	Tan $\alpha$ ur	
155	1	0-6	--	--	44	--	--	--	--	44	--	--	--	--	--	--	+2
		6-12	--	--	211+	--	--	--	--	211+	--	--	--	--	--	--	
156	1	0-6	105.2	17.6	153	1.24	190	105.2	17.6	153	1.24	190					+3
		6-12	103.9	18.2	198	1.14	226	103.9	18.2	198	1.14	226					
157	1	0-6	104.3	17.4	93	--	--	104.3	17.4	93	--	--					+3
		6-12	100.8	19.6	173	--	--	100.8	19.6	173	--	--					
158	1	0-6	95.2	9.8	318	--	--										
		6-12	92.0	10.2	270	--	--										
161	1	0-6	--	--	89	--	--										
		6-12	--	--	197	--	--										
162	1	0-6	108.6	15.6	64	0.48	31										
		6-12	107.6	18.8	56	0.22	12										
163	1	0-6	90.2	17.0	127	--	--										
		6-12	--	--	142	--	--										
164	1	0-6	91.8	23.4	122	0.34	41	91.8	23.4	122	0.34	41					+2
		6-12	95.8	22.9	138	0.20	28	95.8	22.9	138	0.20	28					
165	1	0-6	99.2	22.1	55	0.81	45										
		6-12	102.0	20.8	117	0.78	91										
166	1	0-6	106.1	18.4	99	0.26	26										
		6-12	110.4	20.2	103	0.51	53										
167	1	0-6	103.0	21.3	63	0.36	23	103.0	21.3	63	0.36	23					+6
		6-12	99.6	23.0	111	0.72	80	99.6	23.0	111	0.72	80					
168	1	0-6	107.0	18.4	140	0.90	126	107.0	18.4	140	0.90	126					+12
		6-12	113.9	16.0	204	0.64	131	113.9	16.0	204	0.64	131					
170	1	0-6	85.5	21.9	43	0.38	16										
		6-12	96.8	18.4	67	--	--										
171	1	0-6	91.4	24.9	57	0.64	36										
		6-12	98.9	19.8	118	0.33	39										
172	1	0-6	91.1	26.4	60	0.34	20	91.1	26.4	60	0.34	20					+3
		6-12	96.7	23.8	68	0.12	8	96.7	23.8	68	0.12	8					
173	1	0-6	94.6	23.7	49	0.28	14	94.6	23.7	49	0.28	14					6
		6-12	94.6	22.9	51	0.28	14	94.6	22.9	51	0.28	14					
174	1	0-6	89.0	24.6	95	0.36	34	89.0	24.6	95	0.36	34					12
		6-12	92.6	22.8	60	0.16	10	92.6	22.8	60	0.16	10					
175	1	0-6	100.8	20.0	65	0.82	53	100.8	20.0	65	0.82	53					+7
		6-12	100.2	20.4	106	0.22	23	100.2	20.4	106	0.22	23					
176	1	0-6	90.5	25.8	127+	0.59	75+	90.5	25.8	127+	0.59	75+					+10
		6-12	100.8	20.8	300+	--	--	100.8	20.8	300+	--	--					
177	1	0-6	97.0	24.3	128	0.63	81	97.0	24.3	128	0.63	81					+3
		6-12	94.8	27.6	270	0.47	127	94.8	27.6	270	0.47	127					
178	1	0-6	77.4	40.5	36	0.44	16	77.4	40.5	36	0.44	16					+6
		6-12	83.6	37.2	124	0.84	104	83.6	37.2	124	0.84	104					
179	1	0-6	100.4	22.0	91	0.20	18	100.4	22.0	91	0.20	18					+6
		6-12	--	27.6	129	0.55	71	--	27.6	129	0.55	71					
180	1	0-6	83.3	33.4	99	0.76	75	83.3	33.4	99	0.76	75					+2
		6-12	85.2	32.0	127	0.84	107	85.2	32.0	127	0.84	107					
181	1	0-6	88.2	30.6	104	0.37	38	88.2	30.6	104	0.37	38					+12
		6-12	96.4	25.0	193	0.42	81	96.4	25.0	193	0.42	81					
182	1	0-6	--	26.8	143	0.66	94	--	26.8	143	0.66	94					+1
		6-12	--	22.0	295	--	--	--	22.0	295	--	--					
184	1	0-6	--	39.1	63	1.24	78	--	39.1	63	1.24	78					+6
		6-12	--	25.6	103	0.94	97	--	25.6	103	0.94	97					
186	1	0-6	88.3	29.3	173	--	--										
		6-12	--	--	430	--	--										
187	1	0-6	--	33.8	58	0.90	52	--	33.8	58	0.90	52					+1
		6-12	--	--	117	--	--	--	--	117	--	--					
189	1	0-6	--	29.4	109	0.72	78										
		6-12	--	--	155	--	--										
190	1	0-6	--	--	42	0.98	41	--	--	42	0.98	41					+4
		6-12	--	--	65	1.00	65	--	--	65	1.00	65					
192	1	0-6	--	--	100	--	--										
		6-12	--	--	196	--	--										

(Continued)

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Table A1 (Continued)

Section A. Site Data						Section B. Soil Data													
Location			Topography Class	Topographic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				UNCS				Organic Content %	Specific Gravity	
Site No.	Map Sheet	Grid Coordinates							Texture by Wt. %	Type	By Wt %	Atterberg Limits							
												Sand	Silt	Clay	LL	PL			PI
193	5155II	951381	High	Terrace flat	0	Corn	Cultivated	0-6 6-12	34 36	38 37	28 27	CL L	70 68	-- 31	-- 17	-- 14	CL	1.15 --	-- 2.65
195	5155III	865317	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	13 13	29 20	58 67	C C	92 93	-- 89	-- 43	-- 46	-- MH	4.05 1.77	-- 2.71
196	5155II	911230	Low	Bottomland flat	0	Short grass	Grazed	0-6 6-12	13 --	41 --	46 --	SIC --	93 --	116 --	44 --	72 --	CH --	-- --	2.69 --
198	5154IV	874146	Low	Bottomland flat	0	Trees	Undisturbed	0-6 6-12	5 7	45 36	50 57	SIC C	97 97	-- 76	-- 25	-- 51	-- CH	1.65 1.45	-- 2.72
201	5154I	030191	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	38 43	39 33	23 24	L L	68 63	-- 34	-- 17	-- 17	-- CL	2.75 1.05	-- 2.72
202	5155II	994242	Low	Bottomland flat	0	Tapioca	Cultivated	0-6 6-12	28 22	45 42	27 36	CL L	78 83	34 37	20 18	14 19	CL CL	2.87 1.65	-- 2.70
206	5154I	130102	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	12 9	40 38	48 53	SIC C	88 92	-- 61	-- 22	-- 39	-- CH	-- --	-- 2.75
208	5757III	590000	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	53 40	39 28	8 32	SL CL	57 67	15 38	14 15	1 23	ML CL	1.65 1.33	-- 2.66
210	5557I	739230	Low	Bottomland flat	0	Rice	Cultivated	0-6 6-12	73 75	25 22	2 3	LS LS	43 43	-- 14	-- --	-- NP	-- SM	0.62 0.46	-- 2.63
211	5657IV	012111	Low	Bottomland flat	<1	Rice	Cultivated	0-6 6-12	50 42	42 38	8 20	L L	69 70	21 27	19 15	2 12	ML CL	1.88 2.08	-- 2.64

(Continued)

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Table A1 (Concluded)

Section C. Trafficability Data																					
Wet-Season Condition								High-Moisture Condition													
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Shear-graph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Shear-graph				Depth to Water Table in.
								c <sub>u</sub> psi	Tan $\phi$ u	c <sub>u</sub> psi	Tan $\phi$ u						c <sub>u</sub> psi	Tan $\phi$ u	c <sub>u</sub> psi	Tan $\phi$ u	
193	1	0-6	101.1	21.6	113	1.00	113														
		6-12	--	--	205	--	--														
195	1	0-6	--	58.2	51	1.04	53				--	58.2	51	1.04	53					+6	
		6-12	--	--	77	0.84	65				--	--	77	0.84	65						
196	1	0-6	--	--	55	--	--				--	--	55	--	--					+2	
		6-12	--	--	67	--	--				--	--	67	--	--						
198	1	0-6	74.2	45.6	27	0.62	17														
		6-12	83.6	37.5	59	0.68	40														
201	1	0-6	--	35.2	48	--	--				--	35.2	48	--	--					+2	
		6-12	--	23.4	101	--	--				--	23.4	101	--	--						
202	1	0-6	94.6	24.7	60	0.66	40														
		6-12	101.4	22.6	97	0.68	66														
206	1	0-6	91.8	30.7	52	0.80	42														
		6-12	--	--	88	0.84	74														
208	1	0-6	99.5	19.8	147	0.36	53				99.5	19.8	147	0.36	53					+6	
		6-12	100.2	20.5	165	0.58	96				100.2	20.5	165	0.58	96						
210	1	0-6	101.4	17.8	184	--	--														
		6-12	100.5	17.8	475	--	--														
211	1	0-6	--	22.3	78	0.80	62				--	22.3	78	0.80	62					9	
		6-12	--	25.9	105	0.82	86				--	25.9	105	0.82	86						

Table A2  
Trafficability Classification Study  
Summary of Site, Soil, and Trafficability Data

Section A. Site Data									Section B. Soil Data										
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA Texture by Wt. %			By Wt % Fines	USCS Atter- berg Limits			Type	Or- ganic Con- tent %	Spe- cific Grav- ity	
Site No.	Map Sheet	Grid Coor- di- nates							Sand	Silt	Clay		LL	PL	PI				
Nakhon Sawan Area																			
1A	5958I	955583	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 50	-- 16	-- 34	SCL	52	27	13	14	CL	0.62	--
1B	5958I	957584	Low	Terrace flat	0	Low scrub savanna	Undisturbed	0-6 6-12	-- 43	-- 23	-- 34	CL	61	33	14	19	CL	0.70	--
1C	5958I	950589	Low	Upland depression	0	Low scrub savanna	Undisturbed	0-6 6-12	-- 52	-- 27	-- 21	SCL	58	24	12	12	CL	1.10	--
1D	5958I	950589	Low	Upland flat	0	Low scrub savanna	Undisturbed	0-6 6-12	-- 27	-- 39	-- 34	CL	83	33	16	17	CL	1.40	2.72
2A	5958I	975562	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 49	-- 18	-- 33	SCL	53	36	18	18	CL	0.70	2.72
2B	5958I	978563	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 48	-- 30	-- 22	L	63	21	12	9	CL	0.76	--
2C	5958I	982568	Low	Terrace slope	1	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 40	-- 37	-- 23	L	67	25	15	10	CL	1.56	--
2D	5958I	984570	Low	Terrace flat	0	Tall scrub savanna	Cultivated (corn, rice)	0-6 6-12	-- 16	-- 49	-- 35	S1CL	90	29	17	12	CL	1.90	--
2E	5958I	994588	Low	Terrace flat	0	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 78	-- 16	-- 6	LS	27	--	--	NP	SH	0.31	2.62
3A	4958II	987476	Low	Terrace flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 64	-- 22	-- 14	SL	49	19	14	5	SH-SC	0.86	2.60
3B	4958II	993480	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 43	-- 39	-- 18	L	68	24	14	10	CL	0.78	--
4A	5058III	115373	Low	Natural levee	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 38	-- 34	-- 28	CL	70	34	20	14	CL	0.86	--
4B	5058III	115373	Low	Stream bottom	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 19	-- 50	-- 31	S1CL	88	34	20	14	CL	1.72	--
4C	5058III	115374	Low	Natural levee	11	Short-grass prairie	Undisturbed	0-6 6-12	-- 51	-- 35	-- 14	L	65	21	16	5	CL-ML	1.24	2.60
4D	5058III	101395	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 67	-- 23	-- 10	SL	42	12	10	2	SH	0.76	2.61
4E	5058III	110392	Low	Terrace flat	0	Tall scrub savanna	Banana orchard	0-6 6-12	-- 70	-- 22	-- 8	SL	41	15	14	1	SH	1.24	2.61
5A	5057IV	213215	Low	Lower slope	1	Tall scrub savanna	Cultivated (corn)	0-6 6-12	-- 31	-- 39	-- 30	CL	75	42	24	18	CL	2.90	--
5B	5057IV	215214	Low	Lower slope	1	Short-grass prairie	Cultivated (corn)	0-6 6-12	-- 41	-- 33	-- 26	L	69	31	17	14	CL	2.75	--
5C	5057IV	224212	High	Upper slope	13	Tall scrub savanna	Undisturbed	0-6 6-12	-- 43	-- 41	-- 16	L	60	27	25	2	ML	1.05	--
5D	5057IV	227211	High	Upland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	-- 25	-- 38	-- 37	CL	82	43	24	19	CL	2.35	2.74
5E	5057IV	233209	Low	Upland depression	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 37	-- 32	-- 31	CL	68	41	16	25	CL	1.40	--
6A	5058III	207343	Low	Natural levee	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 34	-- 44	-- 22	L	85	30	20	10	CL	1.40	--
6B	5058III	207342	Low	Bottomland flat	0	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 31	-- 34	-- 35	OCL	52	36	17	19	CL	1.05	2.73
6C	5058III	207341	Low	Bottomland flat	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 21	-- 37	-- 42	C	80	55	21	34	CH	0.76	--
6D	5058III	207341	High	Terrace flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	-- 18	-- 42	-- 40	S1CL	81	56	20	36	CH	0.46	--
6E	5058III	207341	High	Lower slope	1	Tall scrub savanna	Undisturbed	0-6 6-12	-- 14	-- 30	-- 56	C	86	70	27	43	CH	1.40	2.74
7A	5057IV	226322	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 16	-- 51	-- 33	S1CL	90	49	21	28	CL	2.10	--
7B	5057IV	227322	Low	Terrace slope	4	Tall scrub savanna	Cocoon orchard	0-6 6-12	-- 37	-- 31	-- 32	OCL	51	35	18	17	CL	1.15	2.74
7C	5057IV	227322	Low	Terrace flat	0	Low scrub savanna	Undisturbed	0-6 6-12	-- 33	-- 34	-- 33	CL	73	60	28	32	CH	1.10	--

(Continued)

\* 0 = gravelly; VU = very gravelly.

(1 of 16 sheets)



Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Shearograph**				Dry Density lb/cu ft	Shearograph**				Depth to Water Table? in.								
				MC, %	CI	RI	RCI		c <sub>u</sub> psi	Tan δ <sub>u</sub>	c <sub>ur</sub> psi	Tan δ <sub>ur</sub>		c <sub>u</sub> psi	Tan δ <sub>u</sub>	c <sub>ur</sub> psi	Tan δ <sub>ur</sub>				
Makhuu Savan Area																					
1A	1	0-6 6-12	113.2 107.2	16.6 18.9	60 83	-- 0.40	-- 33	3.6 113.2	0.30 107.2	1.4 18.9	0.70 83	113.2 107.2	16.6 18.9	60 83	-- 0.40	-- 33	-- --	-- --	-- --	5.0	
1B	1	0-6 6-12	109.5 102.8	16.1 20.8	163 132	-- 1.00	-- 132	5.0	0.75	0.8	0.62										
1C	1	0-6 6-12	95.0 97.0	23.6 24.0	38 58	-- 0.58	-- 34	5.5	0.75	0.8	0.60	95.0 97.0	23.6 24.0	38 58	-- 0.58	-- 34	5.5	0.75	0.8	0.60	+0.5
1D	1	0-6 6-12	96.6 89.5	23.1 26.3	208 133	-- 0.63	-- 84	0.7	1.19	2.1	0.51										
2A	1	0-6 6-12	-- --	14.3 25.2	214 305	-- 0.67	-- 204	1.7	0.53	0.2	0.47										
2B	1	0-6 6-12	108.4 108.5	12.6 18.7	163 140	-- 0.58	-- 81	2.0	0.78	1.9	0.53										
2C	1	0-6 6-12	86.6 94.4	19.2 15.7	179 253	-- 0.70	-- 177	2.0	0.78	0.0	0.55										
2D	1	0-6 6-12	91.1 97.7	21.4 25.2	181 172	-- 0.46	-- 79	5.8	0.78	1.0	0.58										
2E	1	0-6 6-12	101.1 105.1	12.4 12.1	66 57	-- 0.56	-- 32	2.0	0.51	0.2	0.40										
3A	1	0-6 6-12	105.4 98.0	13.1 10.1	334 382	-- 0.32	-- 122	3.0	0.53	0.0	0.60										
3B	1	0-6 6-12	105.1 105.6	17.0 21.8	112 107	-- 0.54	-- 58	5.1	0.51	0.7	1.00										
4A	1	0-6 6-12	97.2 88.4	20.2 20.8	246 238	-- 0.58	-- 138	0.2	0.58	0.8	0.58										
4B	1	0-6 6-12	90.6 95.9	27.4 23.9	125 135	-- 0.41	-- 55	3.4	0.36	1.6	0.22	90.6 95.9	27.4 23.9	125 135	-- 0.41	-- 55	-- --	-- --	-- --	12.0	
4C	1	0-6 6-12	-- 94.2	15.8 14.2	540+ 607+	-- 1.86	-- 1129+	0.0	0.84	0.6	0.23										
4D	1	0-6 6-12	109.2 113.8	13.8 13.3	121 87	-- 0.22	-- 19	0.0	0.47	0.0	0.36										
4E	1	0-6 6-12	107.7 94.4	13.4 12.0	146 151	-- 2.05	-- 310	0.0	0.67	0.2	0.40										
5A	1	0-6 6-12	-- --	22.8 23.7	157 255	-- --	-- --	0.8	0.65	0.0	0.51										
5B	1	0-6 6-12	96.3 --	15.9 20.1	191 211	-- 1.23	-- 260	0.0	0.45	0.2	0.58										
5C	1	0-6 6-12	-- --	12.3 15.8	750+ 750+	-- --	-- --	-- --	-- --	-- --	-- --										
5D	1	0-6 6-12	-- --	12.6 14.1	705+ 750+	-- --	-- --	0.0	0.73	0.0	0.47										
5E	1	0-6 6-12	82.3 93.4	41.1 26.4	61 129	-- 0.70	-- 90	0.2	0.09	0.7	0.23										
6A	1	0-6 6-12	90.9 91.0	14.3 28.4	211 277	-- 0.62	-- 173	0.1	0.53	0.0	0.60										
6B	1	0-6 6-12	-- --	26.0 23.5	269+ 693+	-- --	-- --	0.5	0.40	0.2	0.51										
6C	1	0-6 6-12	82.7 89.4	40.2 30.4	62 80	-- 0.81	-- 63	1.0	0.49	0.4	0.27										
6D	1	0-6 6-12	90.5 88.1	22.0 32.6	144 93	-- 0.81	-- 75	0.0	0.58	0.0	0.49										
6E	1	0-6 6-12	-- --	25.2 35.1	154 139	-- 0.94	-- 131	0.0	0.53	0.0	0.34										
7A	1	0-6 6-12	90.2 88.1	32.5 36.5	92 96	-- 0.72	-- 69	2.0	0.30	0.1	0.12	90.2 88.1	32.5 36.5	92 96	-- 0.72	-- 69	2.0	0.30	0.1	0.12	+1.0
7B	1	0-6 6-12	-- --	19.3 22.8	320 543+	-- --	-- --	0.8	0.51	0.2	0.27										
7C	1	0-6 6-12	-- --	23.9 26.6	319 321	-- --	-- --	2.8	0.49	0.7	0.34										

(Continued)

\*\*  $c_u$ , ultimate soil-to-soil cohesion;  $\phi_u$ , ultimate soil-to-soil angle of internal friction;  $a_{ur}$ , ultimate soil-to-rubber adhesion;  
 $\alpha_{ur}$ , ultimate soil-to-rubber angle of friction.

† Plus (+) denotes depth of water above surface.

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Table A2 (Continued)

Section A. Site Data								Section B. Soil Data											
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				UCS				Or- ganic Con- tent %	Spe- cific Grav- ity	
Site No.	Map Sheet	Grid Coor- di- nates							Texture by Wt. %				By Wt %	Atter- berg Limits					
									Sand	Silt	Clay	Type		LL	PL	PI			Type
7D	5057IV	244318	High	Terrace flat	0	Woodland	Undisturbed	0-6 6-12	-- 43	-- 38	-- 19	-- L	-- 52	-- 39	-- 23	-- 16	-- CL	-- 2.60	-- --
7E	5057IV	244318	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 42	-- 38	-- 20	-- L	-- 58	-- 28	-- 12	-- 16	-- CL	-- 0.64	-- --
7F	5057IV	243318	Low	Bottomland depression	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 31	-- 50	-- 19	-- SIL	-- 66	-- 28	-- 12	-- 16	-- CL	-- 0.92	-- --
8A	5057IV	206259	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 44	-- 32	-- 24	-- L	-- 66	-- 30	-- 16	-- 14	-- CL	-- 2.30	-- --
8B	5057IV	206259	Low	Terrace Slope	1	Low scrub savanna	Cultivated (idle)	0-6 6-12	-- 27	-- 40	-- 33	-- CL	-- 82	-- 63	-- 23	-- 40	-- CH	-- 3.10	-- --
8C	5057IV	223266	High	Upper slope	5	Low scrub savanna	Undisturbed	0-6 6-12	-- 55	-- 29	-- 16	-- SL	-- 48	-- 25	-- 18	-- 7	-- SM-SC	-- 3.10	-- 2.72
8D	5057IV	217268	High	Drainage ditch	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 20	-- 67	-- 13	-- SIL	-- 95	-- 35	-- 28	-- 7	-- ML	-- 2.75	-- --
8E	5057IV	207264	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 51	-- 30	-- 19	-- L	-- 57	-- 31	-- 17	-- 14	-- CL	-- 4.75	-- --
9A	5057IV	209322	Low	Bottomland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	-- 42	-- 35	-- 23	-- L	-- 59	-- 43	-- 19	-- 24	-- CL	-- 3.50	-- --
9B	5057IV	214187	Low	Bottomland depression	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 48	-- 27	-- 25	-- VGSC	-- 23	-- 26	-- 13	-- 13	-- GC	-- 0.76	-- --
9C	5057IV	214187	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 63	-- 24	-- 13	-- SL	-- 41	-- 18	-- 12	-- 6	-- SM-SC	-- 0.64	-- --
Low Burd Area																			
10A	5153IV	854741	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 5	-- 43	-- 52	-- SIC	-- 98	-- 69	-- 26	-- 43	-- CH	-- 1.60	-- 2.72
10B	5153IV	859734	Low	Terrace flat	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 15	-- 40	-- 45	-- SIC	-- 89	-- 55	-- 27	-- 28	-- CH	-- 1.10	-- --
10C	5153IV	713745	Low	Bottomland depression	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 12	-- 45	-- 43	-- SIC	-- 98	-- 55	-- 24	-- 31	-- CH	-- 0.92	-- --
10D	5153IV	713744	Low	Terrace slope	3	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 9	-- 45	-- 46	-- SIC	-- 98	-- 56	-- 23	-- 33	-- CH	-- 1.60	-- --
10E	5153IV	712744	Low	Terrace flat	0	Short-grass prairie	Lawn	0-6 6-12	-- 15	-- 43	-- 42	-- SIC	-- 89	-- 44	-- 20	-- 24	-- CL	-- 1.10	-- --
11A	5154III	721871	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 9	-- 41	-- 50	-- SIC	-- 98	-- 70	-- 29	-- 41	-- CH	-- 1.40	-- 2.69
11B	5154III	717872	Low	Terrace flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 12	-- 53	-- 35	-- SICL	-- 98	-- 48	-- 20	-- 28	-- CL	-- 1.10	-- --
11C	5154III	717872	Low	Natural levee	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 18	-- 51	-- 31	-- SICL	-- 99	-- 42	-- 19	-- 23	-- CL	-- 2.10	-- --
11D	5153IV	774824	Low	Bottomland flat	0	Tall-grass prairie	Cultivated (rice)	0-6 6-12	-- 8	-- 39	-- 53	-- C	-- 98	-- 70	-- 26	-- 44	-- CH	-- 1.72	-- --
11E	5153IV	705724	Low	Natural levee	0	Woodland	Apple orchard	0-6 6-12	-- 5	-- 40	-- 55	-- SIC	-- 99	-- 67	-- 22	-- 45	-- CH	-- 1.24	-- --
12A	5154II	939923	Low	Terrace flat	0	Tall scrub savanna	Cultivated (idle)	0-6 6-12	-- 19	-- 38	-- 43	-- C	-- 83	-- 54	-- 22	-- 32	-- CH	-- 2.30	-- 2.66
12B	5154II	939923	Low	Terrace flat	0	Woodland	Undisturbed	0-6 6-12	-- 14	-- 36	-- 50	-- C	-- 91	-- 65	-- 23	-- 42	-- CH	-- 3.50	-- --
12C	5154II	027877	Low	Terrace flat	0	Woodland	Apple orchard	0-6 6-12	-- 16	-- 62	-- 22	-- SIL	-- 94	-- 39	-- 24	-- 15	-- CL	-- 3.50	-- --
12D	5154II	025877	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 12	-- 46	-- 42	-- SIC	-- 94	-- 46	-- 22	-- 24	-- CL	-- 2.30	-- --
12E	5154II	015846	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 10	-- 33	-- 57	-- C	-- 97	-- 88	-- 26	-- 62	-- CH	-- 1.10	-- --
13A	5155III	873316	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 9	-- 45	-- 46	-- SIC	-- 93	-- 80	-- 30	-- 50	-- CH	-- 2.30	-- 2.67
13B	5155III	873317	Low	Terrace slope	5	Tall-grass prairie	Cultivated (grazed)	0-6 6-12	-- 9	-- 65	-- 26	-- SIL	-- 94	-- 60	-- 23	-- 37	-- CH	-- 2.75	-- --
13C	5155III	873317	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 22	-- 55	-- 23	-- SIL	-- 71	-- 57	-- 27	-- 30	-- CH	-- 3.10	-- --
13D	5155III	841331	Low	Terrace flat	0	Woodland	Cocunut orchard	0-6 6-12	-- 19	-- 63	-- 18	-- SIL	-- 70	-- 35	-- 22	-- 13	-- CL	-- 2.30	-- --

(Continued)

(3 of 16 sheets)

Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Depth to Water Table in.
								c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\phi_{ur}$						c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\phi_{ur}$	
7D	1	0-6 6-12	-- --	12.6 10.5	348+ 713+	-- --	-- --	0.8	0.27	1.4	0.20										
7E	1	0-6 6-12	108.8 103.6	16.3 16.5	54 79	-- 0.48	-- 38	0.4	0.16	0.3	0.09										
7F	1	0-6 6-12	104.0 110.3	19.8 17.9	152 271	-- 0.48	-- 130	2.2	0.23	1.0	0.22										
8A	1	0-6 6-12	74.3 100.2	37.6 17.9	92 142	-- 1.00	-- 142	0.0	0.30	0.0	0.25										
8B	1	0-6 6-12	-- --	21.0 22.3	356 382	-- --	-- --	0.8	0.23	1.0	0.16										
8C	1	0-6 6-12	-- --	7.9 8.7	613+ 750+	-- --	-- --	0.0	0.28	1.0	0.22										
8D	1	0-6 6-12	-- --	7.8 8.4	608+ 741+	-- --	-- --	1.9	0.47	0.7	0.27										
8E	1	0-6 6-12	107.1 83.6	17.0 32.6	85 127	-- 0.74	-- 94	2.0	0.18	3.4	0.12										
9A	1	0-6 6-12	87.4 86.6	27.9 34.5	145 168	-- 0.66	-- 111	0.0	0.27	0.0	0.09										
9B	1	0-6 6-12	-- --	29.5 12.6	70 430+	-- --	-- --	0.0	0.16	0.0	0.20										
9C	1	0-6 6-12	-- --	6.2 6.8	575+ 750+	-- --	-- --	0.0	0.40	0.0	0.25										
Los Buri Area																					
10A	1	0-6 6-12	89.1 88.9	27.5 28.1	158 178	-- 0.92	-- 164	1.5	0.34	0.4	0.23										
10B	1	0-6 6-12	74.3 76.6	36.9 38.8	131 92	-- 0.73	-- 67	0.0	0.32	1.0	0.16										
10C	1	0-6 6-12	79.9 92.2	39.4 29.6	63 89	-- 0.64	-- 57	1.0	0.09	0.0	0.07	79.9 92.2	39.4 29.6	63 89	-- 0.64	-- 57	1.0	0.09	0.0	0.07	+1.0
10D	1	0-6 6-12	89.2 93.0	23.1 25.3	110 132	-- 0.71	-- 94	1.6	0.27	2.2	0.07										
10E	1	0-6 6-12	84.2 94.3	23.7 25.1	108 105	-- 0.74	-- 78	2.0	0.23	1.5	0.25										
11A	1	0-6 6-12	84.3 87.4	27.6 34.6	88 114	-- 0.92	-- 105	1.9	0.12	1.0	0.05										
11B	1	0-6 6-12	-- --	27.5 23.6	145 154	-- --	-- --	1.7	0.20	1.7	0.11										
11C	1	0-6 6-12	-- --	15.1 13.6	406 714+	-- --	-- --	2.0	0.22	1.0	0.18										
11D	1	0-6 6-12	77.8 83.5	38.3 35.0	54 104	-- 0.81	-- 84	0.0	0.18	1.0	0.09	77.8 83.5	38.3 35.0	54 104	-- 0.81	-- 84	0.0	0.18	1.0	0.09	+1.0
11E	1	0-6 6-12	88.3 89.4	27.8 30.4	125 124	-- 0.72	-- 89	2.6	0.12	0.5	0.18										
12A	1	0-6 6-12	86.0 --	31.9 33.6	105 113	-- 0.66	-- 74	0.9	0.28	0.7	0.11	86.0 --	31.9 33.6	105 113	-- 0.66	-- 74	--	--	--	--	12.0
12B	1	0-6 6-12	83.2 --	34.8 28.8	118 204	-- --	-- --	1.0	0.28	1.0	0.25										
12C	1	0-6 6-12	-- --	17.5 14.6	417 610+	-- --	-- --	0.0	0.28	0.0	0.30										
12D	1	0-6 6-12	92.3 81.7	24.6 38.4	134 65	-- 0.82	-- 53	1.2	0.32	0.2	0.22										
12E	1	0-6 6-12	86.8 --	31.0 35.7	131 137	-- 0.91	-- 125	1.9	0.40	1.9	0.18										
13A	1	0-6 6-12	65.3 70.4	55.2 44.5	48 83	-- 0.94	-- 78	0.9	0.18	0.0	0.16	65.3 70.4	55.2 44.5	48 83	-- 0.94	-- 78	0.9	0.18	0.0	0.16	+1.0
13B	1	0-6 6-12	84.4 78.0	33.9 41.5	47 76	-- 0.83	-- 63	1.0	0.12	0.2	0.14	84.4 78.0	33.9 41.5	47 76	-- 0.83	-- 63	--	--	--	--	12.0
13C	1	0-6 6-12	-- --	32.6 29.6	79 150	-- --	-- --	1.2	0.18	0.8	0.22										
13D	1	0-6 6-12	94.4 91.5	22.6 21.7	150 154	-- 0.61	-- 94	1.3	0.20	0.3	0.14										

(Continued)

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Table A2 (Continued)

Section A. Site Data									Section B. Soil Data										
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Or-ganic Con-tent %	Spe-cific Grav-ity	
	Map Sheet	Grid Coor-di-nates							Texture by Wt, %				By Wt %	Atter-berg Limits					
									Sand	Silt	Clay	Type		LL	PL	PI			Type
13E	5155III	841331	Low	Terrace slope	5	Woodland	Coconut orchard	0-6 6-12	-- 19	-- 58	-- 23	-- SIL	-- 79	-- 41	-- 22	-- 19	CL	1.72	--
14A	5155II	984265	Low	Bottomland depression	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 14	-- 41	-- 45	-- SIC	-- 93	-- 67	-- 26	-- 41	CH	1.90	2.70
14B	5155II	984265	Low	Terrace slope	2	Tall-grass prairie	Cultivated (peanut)	0-6 6-12	-- 14	-- 43	-- 43	-- SIC	-- 91	-- 65	-- 26	-- 39	CH	2.30	--
14C	5155II	983266	Low	Terrace slope	2	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 14	-- 43	-- 43	-- SIC	-- 92	-- 63	-- 23	-- 40	CH	1.40	--
14D	5155II	957276	Low	Terrace flat	0	Barren	Cultivated (peanut)	0-6 6-12	-- 14	-- 36	-- 50	-- C	-- 90	-- 56	-- 24	-- 32	CH	1.65	2.73
14E	5155II	958275	Low	Terrace flat	0	Barren	Cultivated (peanut)	0-6 6-12	-- 23	-- 39	-- 38	-- CL	-- 84	-- 49	-- 20	-- 29	CL	1.15	--
15A	5154I	041174	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 43	-- 41	-- 16	-- L	-- 65	-- 29	-- 13	-- 16	CL	0.64	2.71
15B	5154I	041173	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 21	-- 60	-- 19	-- SIL	-- 85	-- 27	-- 17	-- 10	CL	0.92	--
15C	5154I	041172	Low	Terrace flat	0	Tall-grass prairie	Lawn	0-6 6-12	-- 36	-- 40	-- 24	-- L	-- 69	-- 37	-- 15	-- 22	CL	1.10	--
15D	5154I	908104	Low	Natural levee	0	Short-grass prairie	Grazed	0-6 6-12	-- 10	-- 45	-- 45	-- SIC	-- 95	-- 55	-- 20	-- 35	CH	1.10	--
15E	5154I	950126	Low	Terrace flat	0	Short-grass prairie	Cultivated (grace.)	0-6 6-12	-- 13	-- 42	-- 45	-- SIC	-- 95	-- 48	-- 22	-- 26	CL	1.24	--
16A	5154I	122126	Low	Natural levee	3	Savanna	Grazed	0-6 6-12	-- 50	-- 35	-- 15	-- L	-- 71	-- 28	-- 22	-- 6	CL-ML	0.78	2.66
16B	5154I	123125	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 57	-- 28	-- 15	-- SL	-- 60	-- 27	-- 23	-- 4	ML	1.10	--
16C	5154I	102074	Low	Natural levee	0	Tall scrub woodland	Banana orchard	0-6 6-12	-- 19	-- 56	-- 25	-- SIL	-- 89	-- 37	-- 22	-- 15	CL	1.72	--
16D	5154I	103076	Low	Bottomland depression	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 7	-- 35	-- 58	-- C	-- 98	-- 62	-- 22	-- 40	CH	1.40	--
16E	5154I	104077	Low	Lower slope	3	Short-grass prairie	Grazed	0-6 6-12	-- 23	-- 45	-- 32	-- CL	-- 86	-- 38	-- 21	-- 17	CL	1.56	--
17A	5154II	038929	Low	Bottomland flat	0	Tall scrub savanna	Cultivated (idle)	0-6 6-12	-- 37	-- 42	-- 21	-- L	-- 77	-- 31	-- 19	-- 12	CL	1.24	--
17B	5154II	037931	Low	Terrace flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 14	-- 39	-- 47	-- C	-- 89	-- 67	-- 23	-- 44	CH	1.56	2.73
17C	5154II	037932	Low	Lower slope	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 17	-- 40	-- 43	-- SIC	-- 92	-- 59	-- 21	-- 38	CH	1.24	--
17D	5154II	059995	Low	Bottomland flat	0	Woodland	Undisturbed	0-6 6-12	-- 27	-- 52	-- 21	-- SIL	-- 81	-- 26	-- 18	-- 8	CL	1.40	2.73
17E	5154II	060999	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 17	-- 74	-- 9	-- SIL	-- 92	-- --	-- --	-- NP	ML	1.24	--
17F	5154II	060999	Low	Terrace slope	1	Barren	Cultivated (rice)	0-6 6-12	-- 17	-- 78	-- 5	-- SIL	-- 90	-- --	-- --	-- NP	ML	0.92	--
18A	5154II	102988	Low	Bottomland depression	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 44	-- 45	-- 11	-- L	-- 63	-- 17	-- 16	-- 1	ML	1.24	2.58
18B	5154II	101989	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 39	-- 49	-- 12	-- L	-- 72	-- 17	-- 16	-- 1	ML	1.10	--
18C	5154II	101991	Low	Terrace flat	0	Tall-grass prairie	Lawn	0-6 6-12	-- 54	-- 36	-- 10	-- SL	-- 54	-- --	-- --	-- NP	ML	1.10	--
18D	5154II	081012	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 52	-- 38	-- 10	-- L	-- 57	-- --	-- --	-- NP	ML	1.40	--
China Nai Area																			
19A	4867IV	166867	Low	Bottomland depression	0	Woodland	Undisturbed	0-6 6-12	-- 80	-- 16	-- 4	-- LS	-- 29	-- --	-- --	-- NP	SH	0.58	--
19B	4867IV	165867	Low	Terrace flat	0	Woodland	Undisturbed	0-6 6-12	-- 79	-- 16	-- 5	-- LS	-- 32	-- --	-- --	-- NP	SH	1.04	2.63
19C	4867IV	162866	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 69	-- 13	-- 18	-- SL	-- 37	-- 24	-- 13	-- 11	SC	0.39	--
19D	4867IV	161866	Low	Drainage ditch	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 55	-- 16	-- 29	-- SCL	-- 57	-- 35	-- 18	-- 17	CL	0.55	--

(Continued)

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Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, % CI RI RCI				Sheargraph				Dry Density lb/cu ft	MC, % CI RI RCI				Sheargraph				Depth to Water Table in.
				cu	Tan	Tan	Tan	cu	Tan	Tan	Tan		cu	Tan	Tan	Tan					
				psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	
13E	1	0-6 6-12	91.5 93.8	25.7 22.9	112 112	— 0.71	— 80	1.5	0.32	1.7	0.14										
14A	1	0-6 6-12	81.4 84.6	36.3 34.6	30 100	— 0.92	— 92	0.4	0.22	1.2	0.09	81.4 84.6	36.3 34.6	30 100	— 0.92	— 92	0.4	0.22	1.2	0.09	+3.0
14B	1	0-6 6-12	83.9 85.6	32.4 30.4	58 133	— 1.16	— 154	1.2	0.22	1.6	0.14										
14C	1	0-6 6-12	86.8 —	30.5 79.4	67 151	— 0.82	— 124	2.0	0.25	1.0	0.16										
14D	1	0-6 6-12	79.1 81.0	29.0 30.5	126 195	— 0.82	— 160	0.6	0.32	1.7	0.30										
14E	1	0-6 6-12	88.6 91.0	25.9 23.9	97 190	— 0.76	— 144	0.4	0.45	0.0	0.28										
15A	1	0-6 6-12	106.8 103.2	19.0 20.4	76 115	— 0.51	— 59	0.5	0.23	0.8	0.09	106.8 103.2	19.0 20.4	76 115	— 0.51	— 59	0.5	0.23	0.8	0.09	+1.0
15B	1	0-6 6-12	98.9 97.0	19.5 23.1	97 147	— 0.55	— 81	0.7	0.27	0.1	0.27										
15C	1	0-6 6-12	93.9 106.3	31.8 19.5	125 143	— 0.88	— 126	1.6	0.28	0.4	0.30										
15D	1	0-6 6-12	92.7 90.6	26.6 25.2	100 149	— 0.95	— 142	1.0	0.23	0.4	0.20										
15E	1	0-6 6-12	89.7 92.5	29.4 26.5	90 147	— 0.93	— 137	1.8	0.23	0.0	0.32										
16A	1	0-6 6-12	88.7 89.4	21.5 14.0	240 390	— 0.95	— 370	1.0	0.40	0.0	0.32										
16B	1	0-6 6-12	93.5 92.3	19.9 15.9	237 356	— 1.07	— 381	0.0	0.49	0.0	0.30										
16C	1	0-6 6-12	82.8 90.5	30.3 27.0	65 70	— 0.61	— 43	1.3	0.32	0.0	0.36										
16D	1	0-6 6-12	88.0 87.6	28.8 31.5	55 95	— 0.49	— 46	0.0	0.18	0.0	0.12	88.0 87.6	28.8 31.5	55 95	— 0.49	— 46	0.0	0.18	0.0	0.12	+3.0
16E	1	0-6 6-12	94.5 91.6	21.9 25.2	244 201	— 0.68	— 137	0.1	0.51	0.0	0.22										
17A	1	0-6 6-12	99.4 94.4	21.3 25.5	105 116	— 0.56	— 65	0.7	0.30	0.0	0.11	99.4 94.4	21.3 25.5	105 116	— 0.56	— 65	—	—	—	—	7.0
17B	1	0-6 6-12	94.8 90.0	22.9 28.0	192 198	— 0.65	— 129	1.9	0.36	2.4	0.09										
17C	1	0-6 6-12	97.3 94.3	23.6 28.5	83 196	— 0.39	— 41	0.5	0.18	1.1	0.18	97.3 94.3	23.6 28.5	83 106	— 0.39	— 41	0.5	0.18	1.1	0.18	+1.0
17D	1	0-6 6-12	79.9 96.0	30.7 18.6	178 165	— 0.24	— 40	0.7	0.45	0.0	0.27										
17E	1	0-6 6-12	— —	14.8 13.3	647 750+	— —	— —	0.0	0.36	0.0	0.28										
17F	1	0-6 6-12	— —	43.3 21.0	437+ 750+	— —	— —	0.0	0.47	1.8	0.32	— —	43.3 21.0	437+ 750+	— —	— —	0.0	0.47	1.8	0.32	+3.0
18A	1	0-6 6-12	97.5 92.8	19.6 25.5	221 205	— 0.15	— 31	2.0	0.22	0.0	0.25	97.5 92.8	19.6 25.5	221 205	— 0.15	— 31	—	—	—	—	9.0
18B	1	0-6 6-12	98.6 97.9	19.3 16.3	221 379	— 0.48	— 182	0.0	0.32	0.0	0.32										
18C	1	0-6 6-12	93.7 92.8	15.9 15.9	423 433	— 1.66	— 719	0.0	0.42	0.8	0.25										
18D	1	0-6 6-12	97.6 102.6	20.0 18.9	261 687+	— 0.46	— 316+	0.0	0.27	0.0	0.20	97.6 102.6	20.0 18.9	261 687+	— 0.46	— 316+	0.0	0.27	0.0	0.20	+0.5
Chiang Mai Area																					
19A	1	0-6 6-12	99.4 102.1	16.5 16.1	96 175	— 0.53	— 93	0.0	0.27	0.7	0.14	99.4 102.1	16.5 16.1	96 175	— 0.53	— 93	0.0	0.27	0.7	0.14	0.0
19B	1	0-6 6-12	92.5 94.8	18.7 19.5	155 174	— 0.52	— 90	0.5	0.30	0.9	0.34										
19C	1	0-6 6-12	86.2 100.0	46.0 22.3	128 112	— 0.28	— 31	—	—	—	—	86.2 100.0	46.0 22.3	128 112	— 0.28	— 31	—	—	—	—	+12.0
19D	1	0-6 6-12	104.9 103.1	21.4 22.9	76 156	— 0.59	— 92	1.6	0.42	0.0	0.23	104.9 103.1	21.4 22.9	76 156	— 0.59	— 92	1.6	0.42	0.0	0.23	+6.0

(Continued)

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Table A2 (Continued)

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				UBCS				Or-ganic Con-tent %	Spe-cifi-grav-ity	
	Map Sheet	Grid Coor-di-nates							Texture by Wt. %				By Wt %	Atter-berg Limits					
									Sand	Silt	Clay	Type		LL	PL	FI			Type
198	4867IV	161862	High	Lower slope	3	Low scrub	Orange orchard	0-6 6-12	-- 75	-- 21	-- 4	-- LS	-- 33	-- --	-- --	-- NP	-- SH	-- 0.78	-- 2.64
199	4867IV	160862	High	Upper slope	2	Woodland	Undisturbed	0-6 6-12	-- 69	-- 24	-- 7	-- SL	-- 42	-- --	-- --	-- NP	-- SH	-- 0.95	-- --
20A	4866IV	135458	Low	Stream bottom	0	Savanna	Undisturbed	0-6 6-12	-- 83	-- 10	-- 7	-- GSL	-- 13	-- --	-- --	-- NP	-- SH	-- 2.10	-- --
20B	4866IV	135458	Low	Bottomland flat	0	Woodland	Undisturbed	0-6 6-12	-- 60	-- 27	-- 13	-- SL	-- 47	-- 23	-- 18	-- 5	-- SH-SC	-- 2.50	-- --
20C	4866IV	134458	High	Terrace flat	0	Tall-grass prairie	Cultivated (peanuts)	0-6 6-12	-- 33	-- 44	-- 23	-- L	-- 81	-- 34	-- 21	-- 13	-- CL	-- 2.66	-- --
20D	4866IV	131458	High	Upper slope	7	Tall-grass prairie	Grassed	0-6 6-12	-- 57	-- 28	-- 15	-- SL	-- 52	-- 16	-- 14	-- 2	-- ML	-- 1.72	-- --
20E	4866IV	133458	High	Upper flat	0	Short-grass prairie	Grassed	0-6 6-12	-- 48	-- 31	-- 21	-- L	-- 63	-- 22	-- 13	-- 9	-- CL	-- 1.40	-- 2.65
20F	4866IV	133458	High	Lower slope	18	Short-grass prairie	Cultivated (pepper)	0-6 6-12	-- 57	-- 27	-- 16	-- SL	-- 49	-- 25	-- 17	-- 8	-- SC	-- 2.66	-- --
21A	4867III	028793	Low	Natural levee	0	Woodland	Undisturbed	0-6 6-12	-- 66	-- 21	-- 13	-- SL	-- 46	-- 20	-- 17	-- 3	-- SH	-- 1.56	-- --
21B	4867III	029794	Low	Terrace flat	0	Tall scrub savanna	Banana orchard	0-6 6-12	-- 55	-- 27	-- 18	-- SL	-- 54	-- 30	-- 18	-- 12	-- CL	-- 1.40	-- --
21C	4867III	029794	Low	Terrace slope	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 56	-- 26	-- 18	-- SL	-- 57	-- 28	-- 18	-- 10	-- CL	-- 0.70	-- 2.68
21D	4867III	030794	Low	Terrace slope	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 58	-- 24	-- 18	-- SL	-- 57	-- 28	-- 18	-- 10	-- CL	-- 0.95	-- --
21E	4867III	031795	Low	Bottomland flat	0	Tall-grass prairie	Banana orchard	0-6 6-12	-- 66	-- 20	-- 14	-- SL	-- 46	-- 24	-- 17	-- 7	-- SH-SC	-- 0.78	-- --
21F	4867III	031795	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 86	-- 9	-- 5	-- LS	-- 20	-- --	-- --	-- NP	-- SH	-- 2.30	-- --
22A	4866IV	014533	Low	Natural levee	4	Tall scrub savanna	Banana Orchard	0-6 6-12	-- 40	-- 31	-- 29	-- CL	-- 76	-- 31	-- 17	-- 14	-- CL	-- 1.40	-- 2.68
22B	4866IV	015533	Low	Bottomland depression	0	Tall scrub woodland	Banana Orchard	0-6 6-12	-- 15	-- 46	-- 39	-- SLCL	-- 88	-- 47	-- 23	-- 24	-- CL	-- 2.30	-- --
22C	4866IV	015533	Low	Terrace slope	5	Tall scrub woodland	Apple Orchard	0-6 6-12	-- 30	-- 40	-- 30	-- CL	-- 78	-- 40	-- 21	-- 19	-- CL	-- 1.90	-- --
22D	4866IV	026531	Low	Bottomland depression	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 13	-- 53	-- 34	-- SLCL	-- 94	-- 33	-- 20	-- 13	-- CL	-- 1.05	-- 2.66
22E	4866IV	027530	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 12	-- 63	-- 25	-- SL	-- 91	-- 34	-- 22	-- 12	-- CL	-- 1.25	-- --
23A	4866IV	097456	Low	Bottomland flat	0	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 34	-- 30	-- 36	-- CL	-- 66	-- 34	-- 26	-- 28	-- CH	-- 2.47	-- 2.80
23B	4866IV	097456	High	Lower slope	9	Tall scrub woodland	Undisturbed	0-6 6-12	-- 24	-- 26	-- 30	-- C	-- 68	-- 78	-- 35	-- 43	-- CH	-- 2.75	-- --
23C	4866IV	096457	High	Upland flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 23	-- 28	-- 49	-- OC	-- 63	-- 72	-- 35	-- 37	-- HI	-- 1.55	-- --
23D	4866IV	053510	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 25	-- 44	-- 31	-- CL	-- 75	-- 32	-- 19	-- 13	-- CL	-- 0.95	-- --
23E	4866IV	054509	Low	Terrace slope	1	Low scrub	Banana orchard	0-6 6-12	-- 63	-- 28	-- 9	-- SL	-- 48	-- --	-- --	-- NP	-- SH	-- 0.86	-- 2.67
23F	4866IV	055509	Low	Terrace slope	1	Woodland	Undisturbed	0-6 6-12	-- 57	-- 32	-- 11	-- SL	-- 54	-- --	-- --	-- NP	-- ML	-- 0.95	-- --
23G	4866IV	050507	Low	Terrace slope	1	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 61	-- 31	-- 8	-- SL	-- 51	-- --	-- --	-- NP	-- ML	-- 0.78	-- --
24A	4766I	854484	Low	Bottomland flat	0	Low scrub savanna	Grassed	0-6 6-12	-- 11	-- 53	-- 34	-- SLCL	-- 94	-- 42	-- 24	-- 18	-- CL	-- 2.30	-- --
24B	4766I	855484	Low	Terrace slope	2	Low scrub	Grassed	0-6 6-12	-- 29	-- 46	-- 25	-- L	-- 79	-- 27	-- 18	-- 9	-- CL	-- 1.10	-- --
24C	4766I	853484	Low	Terrace flat	0	Low scrub	Coconut orchard	0-6 6-12	-- 33	-- 40	-- 27	-- L	-- 75	-- 33	-- 19	-- 14	-- CL	-- 1.90	-- 2.64
24D	4766I	854483	Low	Natural levee	0	Woodland	Banana orchard	0-6 6-12	-- 66	-- 26	-- 8	-- SL	-- 48	-- --	-- --	-- NP	-- SH	-- 1.77	-- --
25A	4766I	892573	Low	Bottomland flat	0	Woodland	Undisturbed	0-6 6-12	-- 45	-- 39	-- 16	-- L	-- 68	-- 33	-- 22	-- 11	-- CL	-- 4.30	-- --

(Continued)

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Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, % CI RI RCI				Sheargraph				Dry Density lb/cu ft	MC, % CI RI RCI				Sheargraph				Depth to Water Table in.
				ME	CI	RI	RCI	c <sub>u</sub> psi	Tan $\phi$	c <sub>ur</sub> psi	Tan $\phi$		ME	CI	RI	RCI	c <sub>u</sub> psi	Tan $\phi$	c <sub>ur</sub> psi	Tan $\phi$	
19E	1	0-6 6-12	94.9 101.3	11.7 15.1	117 297	— 0.86	— 169	0.0 0.32	0.3 0.27												
19F	1	0-6 6-12	88.2 97.6	15.2 13.3	110 116	— 0.98	— 114	1.5 0.34	1.4 0.32												
20A	1	0-6 6-12	89.0 —	23.3 19.9	52 118	— —	— —	1.0 —	0.14 —	0.8 —	0.20	89.0 —	23.3 19.9	52 118	— —	— —	— —	— —	— —	2.0	
20B	1	0-6 6-12	85.7 94.4	22.8 14.6	118 199	— 1.01	— 201	0.9 0.38	0.1 0.51												
20C	1	0-6 6-12	90.0 93.8	24.4 23.9	100 115	— 0.56	— 64	1.6 0.36	0.4 0.30												
20D	1	0-6 6-12	92.4 104.0	24.8 17.6	116 156	— 0.32	— 50	0.4 0.30	0.7 0.23												
20E	1	0-6 6-12	95.7 105.1	17.0 16.6	116 153	— 0.60	— 92	0.3 0.42	0.0 0.36												
20F	1	0-6 6-12	94.0 99.8	15.6 16.3	207 212	— 0.67	— 146	1.0 —	0.38 —	0.0 —	0.18										
21A	1	0-6 6-12	92.7 100.9	22.6 20.1	93 119	— 0.54	— 64	0.8 0.32	1.2 0.32												
21B	1	0-6 6-12	90.1 94.6	30.4 27.4	54 90	— 0.53	— 48	0.9 0.09	0.5 0.05			90.1 94.6	30.4 27.4	54 90	— 0.53	— 48	0.9 0.09	0.5 0.05		+5.0	
21C	1	0-6 6-12	102.6 101.3	16.6 21.5	81 117	— 0.35	— 41	1.0 —	0.18 —	0.1 —	0.18	102.6 101.3	16.6 21.5	81 117	— 0.35	— 41	1.0 —	0.18 —	0.1 —	0.18	+0.5
21D	1	0-6 6-12	88.0 96.3	33.1 25.6	92 123	— 0.37	— 46	1.5 0.16	0.6 0.14			88.0 96.3	33.1 25.6	92 123	— 0.37	— 46	1.5 0.16	0.6 0.14		+2.0	
21E	1	0-6 6-12	91.9 100.6	28.0 21.9	59 142	— 0.36	— 51	1.5 —	0.34 —	0.3 —	0.30	91.9 100.6	28.0 21.9	59 142	— 0.36	— 51	1.5 —	0.34 —	0.3 —	0.30	0.0
21F	1	0-6 6-12	98.4 98.7	20.0 18.8	159 308	— 0.24	— 91	— —	— —	— —	—	98.4 98.7	20.0 18.8	159 308	— 0.24	— 91	— —	— —	— —	—	+6.0
22A	1	0-6 6-12	91.2 97.7	25.9 22.8	56 111	— 0.53	— 59	1.5 0.28	0.5 0.14												
22B	1	0-6 6-12	76.9 87.5	39.4 33.4	18 48	— 0.54	— 26	1.0 —	0.18 —	0.4 —	0.18	76.9 87.5	39.4 33.4	18 48	— 0.54	— 26	1.0 —	0.18 —	0.4 —	0.18	+6.0
22C	1	0-6 6-12	87.1 96.5	26.2 21.5	57 84	— 0.73	— 61	1.7 0.38	0.7 0.20												
22D	1	0-6 6-12	95.2 97.4	24.7 24.3	181 226	— 0.29	— 66	0.8 0.14	1.0 0.09			95.2 97.4	24.7 24.3	181 226	— 0.29	— 66	0.8 0.14	1.0 0.09		+2.0	
22E	1	0-6 6-12	92.8 94.2	26.5 24.3	214 313	— 0.25	— 78	0.7 0.30	0.2 0.03												
23A	1	0-6 6-12	81.8 87.5	37.3 33.2	101 157	— 0.43	— 68	0.8 0.53	0.5 0.18			81.8 87.5	37.3 33.2	101 157	— 0.43	— 68	0.8 0.53	0.5 0.18		0.0	
23B	1	0-6 6-12	— —	34.3 37.4	137 220	— —	— —	0.7 0.42	1.2 0.09												
23C	1	0-6 6-12	— —	34.9 31.7	150 219	— —	— —	1.8 —	0.27 —	1.2 —	0.03										
23D	1	0-6 6-12	— —	22.9 28.6	421+ 672+	— —	— —	0.3 0.45	0.0 0.18												
23E	1	0-6 6-12	96.4 105.2	21.6 14.8	236 182	— 0.18	— 33	0.5 0.32	0.5 0.25												
23F	1	0-6 6-12	98.3 98.5	15.1 21.5	95 108	— 0.18	— 19	0.0 0.40	0.2 0.30												
23G	1	0-6 6-12	104.3 110.0	15.4 12.4	82 295	— 0.25	— 74	0.7 0.34	0.4 0.23			104.3 110.0	15.4 12.4	82 295	— 0.25	— 74	0.7 0.34	0.4 0.23		+4.0	
24A	1	0-6 6-12	86.4 88.5	28.4 28.7	97 168	— 0.54	— 91	1.8 —	0.16 —	0.8 —	0.14	86.4 88.5	28.4 28.7	97 168	— 0.54	— 91	— —	— —	— —	—	4.0
24B	1	0-6 6-12	89.8 —	23.6 15.0	290+ 750+	— —	— —	2.0 —	0.16 —	0.0 —	0.18										
24C	1	0-6 6-12	85.6 95.0	31.1 22.6	87 130	— 0.69	— 90	2.1 —	0.22 —	0.1 —	0.25										
24D	1	0-6 6-12	83.9 84.4	15.6 20.2	93 232+	— 1.60	— 403+	0.5 —	0.32 —	0.2 —	0.28										
25A	1	0-6 6-12	77.6 79.6	29.0 14.7	71 150	— 0.93	— 140	1.3 —	0.45 —	0.0 —	0.30										

(Continued)

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Table A2 (Continued)

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				UCS				Or-ganic Con-tent %	Spe-cific Grav-ity	
	Map Sheet	Grid Coor-di-nates							Texture by Wt. %			By Wt %	Atter-berg Limits						
									Sand	Silt	Clay		Type	LL	PL	FI			Type
25B	4866I	891572	Low	Terrace slope	2	Tall scrub savanna	Apple orchard	0-6 6-12	-- 45	-- 33	-- 22	-- L	-- 66	-- 26	-- 16	-- 10	-- CL	-- 0.86	-- 2.66
25C	4866I	889571	High	Terrace flat	0	Savanna	Grazed	0-6 6-12	-- 75	-- 18	-- 7	-- SL	-- 32	-- --	-- --	-- NP	-- SM	-- 0.86	-- --
26A	4767I	948978	Low	Bottomland flat	0	Tall scrub savanna	Cultivated (rice)	0-6 6-12	-- 55	-- 17	-- 28	-- SCL	-- 51	-- 25	-- 12	-- 13	-- CL	-- 1.05	-- --
26B	4767I	948978	Low	Terrace flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	-- 43	-- 38	-- 19	-- L	-- 62	-- 28	-- 18	-- 10	-- CL	-- 3.96	-- --
26C	4767I	947978	High	Lower slope	9	Tall-grass prairie	Banana orchard	0-6 6-12	-- 76	-- 16	-- 8	-- SL	-- 28	-- --	-- --	-- NP	-- SM	-- 1.10	-- 2.64
26D	4767I	947978	High	Upper slope	9	Tall scrub savanna	Cultivated (peanuts)	0-6 6-12	-- 77	-- 19	-- 4	-- LS	-- 28	-- --	-- --	-- NP	-- SM	-- 0.62	-- --
26E	4767I	947978	High	Upland flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 74	-- 15	-- 11	-- SL	-- 31	-- --	-- --	-- NP	-- SM	-- 0.55	-- --
27A	4767II	962791	Low	Terrace flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 58	-- 25	-- 17	-- SL	-- 47	-- 19	-- 13	-- 6	-- SM-SC	-- 0.78	-- --
27B	4767II	961792	Low	Lower slope	1	Short-grass prairie	Grazed	0-6 6-12	-- 55	-- 28	-- 17	-- SL	-- 52	-- 22	-- 14	-- 8	-- CL	-- 0.78	-- 2.62
27C	4767II	959793	Low	Lower slope	1	Short-grass prairie	Grazed	0-6 6-12	-- 63	-- 25	-- 12	-- SL	-- 42	-- 17	-- 14	-- 3	-- SM	-- 1.40	-- --
27D	4767II	959794	Low	Natural levee	0	Savanna	Banana orchard	0-6 6-12	-- 57	-- 24	-- 19	-- SL	-- 49	-- 22	-- 15	-- 7	-- SM-SC	-- 1.40	-- --
Chanthaburi Area																			
28A	5448IV	889951	Low	Terrace slope	2	Short-grass prairie	Grazed	0-6 6-12	-- 52	-- 22	-- 26	-- SCL	-- 54	-- 32	-- 14	-- 18	-- CL	-- 1.72	-- 2.66
28B	5448IV	889952	Low	Terrace slope	2	Short-grass prairie	Grazed	0-6 6-12	-- 53	-- 24	-- 23	-- SCL	-- 52	-- 24	-- 15	-- 9	-- CL	-- 0.78	-- --
28C	5448IV	889952	Low	Terrace slope	2	Short-grass prairie	Grazed	0-6 6-12	-- 53	-- 26	-- 21	-- SCL	-- 51	-- 25	-- 16	-- 9	-- CL	-- 1.05	-- --
28D	5448IV	889953	Low	Terrace flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 51	-- 24	-- 25	-- SCL	-- 58	-- 28	-- 17	-- 11	-- CL	-- 1.88	-- 2.66
29A	5448IV	840933	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 37	-- 43	-- 20	-- L	-- 67	-- 44	-- 24	-- 20	-- CL	-- 5.74	-- 2.66
29B	5448IV	838932	Low	Bottomland flat	0	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 34	-- 45	-- 21	-- L	-- 78	-- 88	-- 33	-- 55	-- CH	-- 15.00	-- 2.46
29C	5448IV	841934	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 27	-- 46	-- 27	-- L	-- 78	-- 34	-- 17	-- 17	-- CL	-- 2.90	-- --
30A	5448IV	759003	Low	Natural levee	0	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 54	-- 19	-- 27	-- SCL	-- 58	-- 28	-- 16	-- 12	-- CL	-- 3.10	-- 2.62
30B	5448IV	759004	Low	Terrace slope	2	Tall scrub woodland	Cultivated (pepper)	0-6 6-12	-- 62	-- 17	-- 21	-- SCL	-- 48	-- 23	-- 15	-- 8	-- SC	-- 1.72	-- --
30C	5448IV	758005	Low	Terrace slope	2	Woodland	Undisturbed	0-6 6-12	-- 68	-- 12	-- 20	-- SL	-- 41	-- 17	-- 12	-- 5	-- SM-SC	-- 1.40	-- 2.64
30D	5448IV	758006	Low	Terrace flat	0	Woodland	Undisturbed	0-6 6-12	-- 61	-- 16	-- 22	-- SCL	-- 51	-- 23	-- 14	-- 9	-- CL	-- 1.72	-- --
31A	5349II	213078	Low	Natural levee	5	Tall scrub woodland	Undisturbed	0-6 6-12	-- 41	-- 37	-- 22	-- L	-- 76	-- 41	-- 25	-- 16	-- CL	-- 1.40	-- 2.66
31B	5349II	213078	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 11	-- 57	-- 32	-- S1CL	-- 93	-- 65	-- 33	-- 32	-- MH	-- 2.30	-- --
31C	5349II	212078	Low	Bottomland depression	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 17	-- 53	-- 30	-- S1CL	-- 94	-- 35	-- 28	-- 27	-- CH	-- 1.90	-- --
32A	5349II	141101	Low	Terrace flat	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 68	-- 24	-- 8	-- SL	-- 49	-- --	-- --	-- NP	-- SM	-- 0.86	-- --
32B	5349II	141101	Low	Lower slope	8	Tall-grass prairie	Undisturbed	0-6 6-12	-- 67	-- 22	-- 11	-- SL	-- 49	-- 12	-- --	-- NP	-- SM	-- 0.86	-- 2.64
32C	5349II	141102	Low	Upper slope	10	Low scrub savanna	Cultivated (rice)	0-6 6-12	-- 47	-- 35	-- 18	-- L	-- 61	-- 27	-- 16	-- 11	-- CL	-- 0.86	-- 2.65
32D	5349II	141102	Low	Upper slope	11	Low scrub savanna	Cultivated (rice)	0-6 6-12	-- 52	-- 26	-- 22	-- S1CL	-- 61	-- 24	-- 14	-- 10	-- CL	-- 0.86	-- 2.68
33A	5448IV	759001	Low	Bottomland depression	0	Woodland	Rubber plantation	0-6 6-12	-- 12	-- 57	-- 31	-- S1CL	-- 92	-- 33	-- 33	-- 20	-- MH	-- 2.50	-- 2.64

(Continued)

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Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition														High-Moisture Condition							
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Depth to Water Table in.
								c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi	Tan $\phi$ ur						c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi	Tan $\phi$ ur	
25B	1	0-6 6-12	99.0 106.5	20.4 17.2	85 136	-- 0.67	-- 91	0.8 0.30	1.1 0.22												
25C	1	0-6 6-12	99.6 104.0	12.9 11.7	81 93	-- 0.81	-- 75	1.3 0.32	0.0 0.42												
26A	1	0-6 6-12	-- --	24.7 15.2	127 195	-- 0.40	-- 78	-- --	-- --	-- --	24.7 15.2	127 195	-- 0.40	-- 78	-- --	-- --	-- --	-- --	-- --	+15.0	
26B	1	0-6 6-12	87.3 86.7	27.9 30.4	69 58	-- 0.32	-- 19	1.0 0.49	0.0 0.45	87.3 86.7	27.9 30.4	69 58	-- 0.32	-- 19	-- --	-- --	-- --	-- --	-- --	11.0	
26C	1	0-6 6-12	94.9 100.1	11.6 10.7	86 111	-- 1.93	-- 214	0.0 0.55	0.0 0.32												
26D	1	0-6 6-12	97.9 --	10.0 10.8	97 158	-- 3.69	-- 583	0.0 0.40	0.6 0.34												
26E	1	0-6 6-12	101.0 112.0	12.5 11.8	204 239	-- --	-- --	0.9 0.38	0.6 0.22												
27A	1	0-6 6-12	89.9 107.2	28.2 16.3	148 173	-- 0.32	-- 55	1.3 0.38	0.7 0.22												
27B	1	0-6 6-12	99.4 110.7	18.9 12.6	249 356	-- 0.65	-- 231	1.2 0.30	0.3 0.30												
27C	1	0-6 6-12	94.6 104.2	23.9 15.3	381 420	-- 0.35	-- 147	1.0 0.42	0.3 0.23												
27D	1	0-6 6-12	98.7 102.9	18.5 17.5	93 115	-- 0.47	-- 54	0.3 0.32	0.0 0.28												
Chanthaburi Area																					
28A	1	0-6 6-12	77.4 108.1	44.7 18.7	81 153	-- 0.54	-- 83	1.6 0.27	0.5 0.23	77.4 108.1	44.7 18.7	81 153	-- 0.54	-- 83	1.6 0.27	0.5 0.23	0.5 0.23	0.5 0.23	+1.0		
28B	1	0-6 6-12	102.6 108.4	18.0 17.2	122 112	-- 0.68	-- 76	1.0 0.42	0.0 0.23	102.6 108.4	18.0 17.2	122 112	-- 0.68	-- --	1.0 0.42	0.0 0.23	0.0 0.23	0.0 0.23	0.0		
28C	1	0-6 6-12	92.1 103.7	25.9 19.6	139 147	-- 0.50	-- 74	0.4 0.46	0.2 0.23	92.1 103.7	25.9 19.6	139 147	-- 0.50	-- 74	-- --	-- --	-- --	-- --	4.0		
28D	1	0-6 6-12	99.1 103.6	22.4 18.8	156 145	-- 0.54	-- 78	1.8 0.27	0.2 0.25	99.1 103.6	22.4 18.8	156 145	-- 0.54	-- 78	-- --	-- --	-- --	-- --	6.0		
29A	1	0-6 6-12	83.5 79.0	29.5 37.6	85 93	-- 0.38	-- 35	0.6 0.14	0.0 0.12	83.5 79.0	29.5 37.6	85 93	-- 0.38	-- 35	0.6 0.14	0.0 0.12	0.0 0.12	0.0 0.12	+2.0		
29B	1	0-6 6-12	59.6 49.3	57.7 97.5	40 47	-- 0.51	-- 24	-- --	-- --	59.6 49.3	57.7 97.5	40 47	-- 0.51	-- 24	-- --	-- --	-- --	-- --	+9.0		
29C	1	0-6 6-12	101.1 84.1	18.6 31.5	82 88	-- 0.48	-- 42	0.4 0.36	0.6 0.16	101.1 84.1	18.6 31.5	82 88	-- 0.48	-- 42	0.4 0.36	0.6 0.16	0.6 0.16	0.6 0.16	+2.0		
30A	1	0-6 6-12	89.2 94.5	22.1 21.5	67 103	-- 0.49	-- 50	0.3 0.25	0.2 0.18												
30B	1	0-6 6-12	93.8 87.4	18.4 20.5	48 50	-- 0.63	-- 32	1.1 0.32	0.2 0.18												
30C	1	0-6 6-12	95.8 98.2	21.7 16.7	99 91	-- 0.46	-- 42	0.0 0.34	0.0 0.27												
30D	1	0-6 6-12	91.0 90.9	23.6 19.1	100 99	-- 0.54	-- 53	0.0 0.36	0.2 0.23												
31A	1	0-6 6-12	77.5 82.3	38.7 32.3	54 69	-- 0.52	-- 36	1.0 0.20	0.2 0.28												
31B	1	0-6 6-12	61.2 75.1	62.1 41.3	35 63	-- 0.69	-- 43	0.9 0.22	1.1 0.11												
31C	1	0-6 6-12	62.4 80.7	58.6 38.3	26 49	-- 0.61	-- 30	-- --	-- --	62.4 80.7	58.6 38.3	26 49	-- 0.61	-- 30	-- --	-- --	-- --	-- --	+5.0		
32A	1	0-6 6-12	80.8 95.7	37.3 22.3	58 109	-- 0.07	-- 8	0.0 0.55	0.0 0.38	80.8 95.7	37.3 22.3	58 109	-- 0.07	-- 8	0.0 0.55	0.0 0.38	0.0 0.38	0.0 0.38	0.0		
32B	1	0-6 6-12	88.7 101.8	19.4 16.6	77 115	-- 0.36	-- 41	0.0 0.53	0.0 0.32												
32C	1	0-6 6-12	91.5 100.9	24.9 18.9	50 96	-- 0.51	-- 49	0.0 0.40	0.9 0.22												
32D	1	0-6 6-12	92.8 104.8	24.3 17.5	76 124	-- 0.52	-- 64	0.5 0.32	0.8 0.25												
33A	1	0-6 6-12	67.8 75.3	50.5 42.5	119 199	-- 0.29	-- 58	0.9 0.45	0.0 0.30	67.8 75.3	50.5 42.5	119 199	-- 0.29	-- 58	0.9 0.45	0.0 0.30	0.0 0.30	0.0 0.30	+6.0		

(Continued)

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Table A2 (Continued)

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	UNDA Texture by Wt. %				By Wt % Fines	Atter-berg Limits			Type	Or-ganic Con-tent %	Spe-cific Grav-ity
	Map Sheet	Grid Coordinates							Sand	Silt	Clay	Type		LL	PL	FI			
33B	5448IV	761000	High	Terrace slope	3	Tall scrub savanna	Cultivated (pepper)	0-6 6-12	-- 17	-- 44	-- 39	-- SCL	-- 87	-- 56	-- 43	-- 13	-- NM	-- 2.10	--
33C	5448IV	762999	High	Terrace flat	0	Forest	Apple orchard	0-6 6-12	-- 19	-- 46	-- 37	-- SCL	-- 86	-- 55	-- 43	-- 12	-- NM	-- 2.30	-- 2.85
34A	5349III	951136	Low	Natural levee	0	Tall scrub savanna	Banana orchard	0-6 6-12	-- 25	-- 48	-- 27	-- L	-- 88	-- 40	-- 25	-- 15	-- CL	-- 2.30	-- 2.64
34B	5349III	951137	Low	Terrace slope	1	Short-grass prairie	Grazed	0-6 6-12	-- 46	-- 23	-- 31	-- SCL	-- 60	-- 28	-- 16	-- 12	-- CL	-- 1.56	--
34C	5349III	950138	Low	Terrace slope	4	Short-grass prairie	Lawn	0-6 6-12	-- 34	-- 20	-- 46	-- SC	-- 42	-- 48	-- 24	-- 24	-- SC	-- 1.77	--
34D	5349III	950139	Low	Terrace slope	3	Short-grass prairie	Lawn	0-6 6-12	-- 34	-- 19	-- 47	-- SC	-- 42	-- 36	-- 19	-- 17	-- SC	-- 1.45	-- 2.80
34E	5349III	949139	High	Lower slope	5	Tall-grass prairie	Undisturbed	0-6 6-12	-- 45	-- 32	-- 23	-- L	-- 58	-- 36	-- 22	-- 14	-- CL	-- 1.88	-- 2.72
35A	5349III	743027	Low	Bottomland flat	0	Tall scrub savanna	Fruit orchard	0-6 6-12	-- 46	-- 38	-- 16	-- L	-- 70	-- 22	-- 15	-- 7	-- CL-NL	-- 2.75	-- 2.64
35B	5349III	743028	Low	Terrace slope	4	Tall scrub savanna	Fruit orchard	0-6 6-12	-- 49	-- 27	-- 24	-- SCL	-- 67	-- 26	-- 13	-- 13	-- CL	-- 1.10	--
35C	5349III	743028	Low	Terrace flat	0	Tall scrub savanna	Fruit orchard	0-6 6-12	-- 65	-- 28	-- 7	-- SL	-- 52	-- 12	-- 12	-- 0	-- ML	-- 0.92	-- 2.63
35D	5349III	742028	Low	Lower slope	5	Tall scrub savanna	Fruit orchard	0-6 6-12	-- 64	-- 27	-- 9	-- SL	-- 45	-- 14	-- --	-- NP	-- SM	-- 1.40	--
35E	5349III	742029	High	Upper slope	10	Tall scrub savanna	Fruit orchard	0-6 6-12	-- 53	-- 25	-- 22	-- SCL	-- 66	-- 26	-- 16	-- 10	-- CL	-- 1.40	--
36A	5248I	578980	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 72	-- 9	-- 19	-- SL	-- 33	-- 34	-- 16	-- 18	-- SC	-- 1.77	-- 2.59
36B	5248I	578979	Low	Terrace slope	2	Low scrub savanna	Grazed	0-6 6-12	-- 92	-- 5	-- 3	-- S	-- 13	-- 11	-- --	-- NP	-- SM	-- 1.89	--
36C	5248I	577979	Low	Terrace flat	0	Low scrub savanna	Grazed	0-6 6-12	-- 96	-- 2	-- 2	-- S	-- 9	-- --	-- --	-- NP	-- SP-SM	-- 1.04	--
36D	5248I	576979	Low	Lower slope	2	Short-grass prairie	Grazed	0-6 6-12	-- 97	-- 1	-- 2	-- S	-- 6	-- --	-- --	-- NP	-- SP-SM	-- 0.63	--
36E	5248I	575979	Low	Upland flat	0	Woodland	Grazed	0-6 6-12	-- 93	-- 5	-- 2	-- S	-- 8	-- --	-- --	-- NP	-- SP-SM	-- 0.89	--
37A	5149II	059082	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 48	-- 26	-- 26	-- SCL	-- 60	-- 30	-- 12	-- 18	-- CL	-- 0.70	-- 2.66
37B	5149II	059082	Low	Terrace slope	3	Tall scrub savanna	Coconut orchard	0-6 6-12	-- 42	-- 32	-- 26	-- L	-- 63	-- 36	-- 15	-- 73	-- CL	-- 1.33	--
37C	5149II	059081	Low	Terrace flat	0	Tall scrub woodland	Coconut orchard	0-6 6-12	-- 58	-- 23	-- 19	-- SL	-- 46	-- 20	-- 12	-- 8	-- SC	-- 0.70	--
37D	5149II	058080	Low	Terrace flat	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 34	-- 41	-- 25	-- L	-- 71	-- 29	-- 14	-- 15	-- CL	-- 2.10	--
Fras Buri Area																			
38A	4947I	943509	Low	Stream bottom	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 23	-- 51	-- 26	-- SLL	-- 88	-- 33	-- 17	-- 16	-- CL	-- 2.10	-- 2.66
38B	4947I	943508	Low	Terrace slope	3	Tall scrub savanna	Coconut orchard	0-6 6-12	-- 48	-- 35	-- 17	-- L	-- 67	-- 23	-- 14	-- 9	-- CL	-- 1.56	--
38C	4947I	943508	Low	Terrace slope	3	Woodland	Coconut orchard	0-6 6-12	-- 42	-- 37	-- 21	-- L	-- 71	-- 20	-- 14	-- 6	-- CL-NL	-- 1.40	--
38D	4947I	943507	Low	Terrace flat	0	Woodland	Coconut orchard	0-6 6-12	-- 47	-- 36	-- 17	-- L	-- 70	-- 20	-- 14	-- 6	-- CL-NL	-- 1.40	--
39A	4947I	937585	Low	Terrace flat	0	Tall scrub woodland	Cultivated (rice)	0-6 6-12	-- 57	-- 31	-- 12	-- SL	-- 58	-- 21	-- 19	-- 2	-- ML	-- 0.95	-- 2.58
39B	4947I	937585	Low	Lower slope	6	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 59	-- 27	-- 14	-- SL	-- 58	-- 20	-- 18	-- 2	-- ML	-- 0.62	-- 2.58
39C	4947I	936586	High	Lower slope	6	Barren	Cultivated (corn)	0-6 6-12	-- 47	-- 27	-- 26	-- SCL	-- 68	-- 27	-- 15	-- 12	-- CL	-- 0.95	--
39D	4947I	936586	High	Upper slope	10	Tall scrub woodland	Cultivated (corn)	0-6 6-12	-- 51	-- 32	-- 17	-- L	-- 67	-- 20	-- 27	-- 3	-- ML	-- 1.10	--
40A	4948II	046493	Low	Natural levee	1	Tall-grass prairie	Grazed	0-6 6-12	-- 67	-- 24	-- 9	-- SL	-- 39	-- 21	-- 18	-- 3	-- SM	-- 3.90	-- 2.64

(Continued)

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Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, % CI				Sheargraph				Dry Density lb/cu ft	MC, % CI				Sheargraph				Depth to Water Table in.
				ME	%	CI	RI	NCI	c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi		Tan $\phi_{ur}$	ME	%	CI	RI	NCI	c <sub>u</sub> psi	Tan $\phi_u$	
32B	1	0-6 6-12	69.8 70.0	41.2 41.7	264 326	— —	— —	— —	0.0 0.67	0.0 0.34											
33C	1	0-6 6-12	57.0 69.6	53.4 43.3	88 79	— 0.68	— 54	— —	0.5 0.47	0.0 0.36											
34A	1	0-6 6-12	79.3 86.5	38.8 30.3	125 114	— 0.54	— 62	— —	1.2 0.18	0.7 0.07											
34B	1	0-6 6-12	96.6 98.7	21.0 19.9	112 112	— 0.59	— 66	— —	1.9 0.23	0.2 0.27											
34C	1	0-6 6-12	90.7 103.0	23.0 17.7	151 186	— 0.83	— 154	— —	0.6 0.30	0.8 0.25											
34D	1	0-6 6-12	90.7 98.7	24.3 18.8	361 583+	— 0.55	— 321+	— —	3.3 0.40	0.7 0.34											
34E	1	0-6 6-12	96.1 94.9	26.9 21.4	425+ 686+	— —	— —	— —	0.2 0.47	0.0 0.30											
35A	1	0-6 6-12	92.6 97.2	23.9 20.2	71 81	— 0.34	— 25	— —	0.3 0.53	0.5 0.36											
35B	1	0-6 6-12	100.5 104.7	17.6 17.7	91 105	— 0.73	— 77	— —	0.0 0.58	0.0 0.30											
35C	1	0-6 6-12	90.8 92.4	17.4 16.7	86 119	— 0.48	— 57	— —	0.6 0.42	0.2 0.36											
35D	1	0-6 6-12	87.7 89.4	16.1 16.0	88 114	— 1.28	— 146	— —	0.4 0.40	0.3 0.27											
35E	1	0-6 6-12	92.4 100.0	19.8 18.6	62 115	— 0.60	— 69	— —	1.6 0.40	1.0 0.36											
36A	1	0-6 6-12	60.3 93.0	56.6 25.3	90 119	— 0.47	— 56	— —	0.4 0.20	0.0 0.23	60.3 93.0	56.6 25.3	90 119	— 0.47	— 56	— —	0.4 0.20	0.0 0.23	44.0		
36B	1	0-6 6-12	88.2 85.1	21.3 25.5	101 117	— 0.38	— 44	— —	1.0 0.30	0.3 0.25	88.2 85.1	21.3 25.5	101 117	— 0.38	— 44	— —	1.0 0.30	0.3 0.25	0.0		
36C	1	0-6 6-12	78.5 96.1	31.0 20.7	91 149	— 0.77	— 115	— —	0.8 0.38	0.9 0.27											
36D	1	0-6 6-12	84.5 90.0	8.1 7.0	96 208	— 1.13	— 235	— —	0.0 0.36	0.0 0.27											
36E	1	0-6 6-12	85.5 88.7	13.3 9.0	107 171	— 0.87	— 149	— —	1.0 0.28	0.0 0.27											
37A	1	0-6 6-12	101.0 106.7	20.3 18.2	45 96	— 0.57	— 55	— —	1.0 0.11	1.0 0.27	101.0 106.7	20.3 18.2	45 96	— 0.57	— 55	— —	1.0 0.11	1.0 0.27	0.0		
37B	1	0-6 6-12	105.7 109.6	16.5 17.3	63 128	— 0.38	— 49	— —	0.7 0.23	0.3 0.23	105.7 109.6	16.5 17.3	63 128	— 0.38	— 49	— —	— —	— —	5.5		
37C	1	0-6 6-12	103.2 106.9	18.1 16.8	31 68	— 0.61	— 41	— —	1.2 0.18	0.4 0.27	103.2 106.9	18.1 16.8	31 68	— 0.61	— 41	— —	1.2 0.18	0.4 0.27	0.0		
37D	1	0-6 6-12	88.1 93.1	30.1 25.0	50 81	— 0.42	— 34	— —	0.0 0.27	0.0 0.27	88.1 93.1	30.1 25.0	50 81	— 0.42	— 34	— —	0.0 0.27	0.0 0.27	0.0		
From Burd Area																					
38A	1	0-6 6-12	85.0 94.5	23.6 18.5	178 172	— 0.67	— 115	— —	1.5 0.65	0.8 0.30											
38B	1	0-6 6-12	93.9 100.1	15.0 14.4	68 95	— 0.76	— 72	— —	0.4 0.42	0.0 0.40											
38C	1	0-6 6-12	94.7 103.8	14.1 14.1	66 118	— 0.74	— 87	— —	0.5 0.32	0.9 0.30											
38D	1	0-6 6-12	96.4 102.5	17.3 16.9	52 73	— 0.45	— 33	— —	0.3 0.32	0.3 0.28											
39A	1	0-6 6-12	82.4 92.2	22.7 20.2	34 49	— 0.23	— 11	— —	0.5 0.30	0.2 0.32											
39B	1	0-6 6-12	92.5 100.8	15.6 16.2	92 106	— 0.37	— 39	— —	0.0 0.34	0.0 0.36											
39C	1	0-6 6-12	95.2 104.3	16.3 15.1	60 85	— 0.83	— 71	— —	0.3 0.42	0.0 0.42											
39D	1	0-6 6-12	97.4 103.1	15.6 13.3	40 79	— 0.81	— 64	— —	0.3 0.51	0.0 0.40											
40A	1	0-6 6-12	87.9 93.0	23.5 17.4	115 143	— —	— —	— —	0.0 0.53	0.2 0.38											

(Continued)

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Table A2 (Continued)

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Type	Or-ganic Con-tent %	Spe-cific Grav-ity
	Map Sheet	Grid Coordi-nates							Texture by Wt. %				By Wt %	Atter-berg Limits					
									Sand	Silt	Clay	Fines		LL	PL	PI			
40B	4948II	046693	Low	Natural levee	1	Tall-grass prairie	Grazed	0-6 6-12	-- 14	-- 63	-- 23	-- SIL	-- 94	-- 35	-- 23	-- 12	-- CL	-- 2.66	--
40C	4948II	046692	Low	Terrace flat	0	Tall scrub savanna	Grazed	0-6 6-12	-- 18	-- 56	-- 26	-- SIL	-- 87	-- 31	-- 18	-- 13	-- CL	-- 1.56	--
40D	4948II	045691	Low	Bottomland flat	0	Tall-grass prairie	Cultivated (rice)	0-6 6-12	-- 17	-- 50	-- 33	-- SICL	-- 92	-- 36	-- 23	-- 13	-- CL	-- 3.10	--
41A	4948I	049853	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 46	-- 27	-- 27	-- SCL	-- 61	-- 34	-- 14	-- 20	-- CL	-- 0.70	--
41B	4948I	050850	Low	Terrace slope	1	Tall-grass prairie	Cultivated (grazed)	0-6 6-12	-- 47	-- 25	-- 28	-- SCL	-- 57	-- 26	-- 12	-- 14	-- CL	-- 0.86	2.66
41C	4948I	052847	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 25	-- 36	-- 39	-- CL	-- 78	-- 40	-- 16	-- 24	-- CL	-- 0.70	--
41D	4948I	053844	Low	Terrace slope	1	Barren	Undisturbed	0-6 6-12	-- 46	-- 28	-- 26	-- L	-- 59	-- 26	-- 12	-- 14	-- CL	-- 0.76	2.64
42A	4949II	038059	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 71	-- 20	-- 9	-- SL	-- 29	-- --	-- --	-- NP	-- SM	-- 0.28	2.63
42B	4949II	038062	Low	Terrace flat	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 63	-- 21	-- 16	-- SL	-- 44	-- 23	-- 15	-- 8	-- SC	-- 0.23	2.64
42C	4949II	039066	Low	Terrace flat	0	Barren	Undisturbed	0-6 6-12	-- 72	-- 16	-- 12	-- SL	-- 31	-- 15	-- 13	-- 2	-- SM	-- 0.38	2.64
42D	4949II	040069	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 48	-- 38	-- 14	-- L	-- 58	-- 17	-- 11	-- 6	-- CL-ML	-- 0.76	2.64
43A	4949II	036010	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 67	-- 22	-- 11	-- SL	-- 41	-- 12	-- 12	-- NP	-- SM	-- 0.32	--
43B	4949II	036013	Low	Terrace flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 68	-- 24	-- 8	-- SL	-- 40	-- 12	-- 12	-- NP	-- SM	-- 0.76	--
43C	4949II	036017	Low	Terrace flat	0	Tall-grass prairie	Cultivated (idle)	0-6 6-12	-- 52	-- 30	-- 18	-- L	-- 53	-- 17	-- 10	-- 7	-- CL-ML	-- 0.62	--
43D	4949II	037030	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 49	-- 33	-- 18	-- L	-- 59	-- 17	-- 12	-- 5	-- CL-ML	-- 0.46	--
44A	4949II	045156	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 34	-- 32	-- 34	-- CL	-- 70	-- 40	-- 15	-- 25	-- CL	-- 1.40	--
44B	4949II	043156	Low	Terrace slope	1	Tall scrub savanna	Undisturbed	0-6 6-12	-- 26	-- 57	-- 17	-- SIL	-- 83	-- 22	-- 16	-- 6	-- CL-ML	-- 1.10	--
44C	4949II	041156	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 25	-- 44	-- 31	-- CL	-- 80	-- 32	-- 13	-- 19	-- CL	-- 0.92	--
44D	4949II	040155	Low	Terrace slope	1	Tall scrub savanna	Grazed	0-6 6-12	-- 37	-- 45	-- 18	-- L	-- 71	-- 23	-- 14	-- 9	-- CL	-- 1.24	--
44E	4949II	039155	Low	Terrace flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 55	-- 28	-- 17	-- SL	-- 54	-- 20	-- 14	-- 6	-- CL-ML	-- 0.62	--
44F	4949II	037155	Low	Terrace flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 50	-- 34	-- 16	-- L	-- 63	-- 22	-- 13	-- 9	-- CL	-- 0.64	--
47A	4949II	063146	Low	Terrace flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 18	-- 38	-- 44	-- C	-- 85	-- 50	-- 22	-- 28	-- CH	-- 2.30	--
47B	4949II	063148	Low	Terrace flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 21	-- 36	-- 43	-- C	-- 83	-- 48	-- 22	-- 26	-- CL	-- 2.50	--
48C	4948I	040961	Low	Terrace slope	3	Short-grass prairie	Undisturbed	0-6 6-12	-- 90	-- 6	-- 4	-- S	-- 12	-- --	-- --	-- NP	-- SP-SM	-- 0.46	--
48D	4948I	038961	Low	Terrace slope	1	Barren	Undisturbed	0-6 6-12	-- 72	-- 16	-- 12	-- SL	-- 54	-- 14	-- 14	-- NP	-- SM	-- 0.95	--
Don Koon Area																			
49A	5460I	200433	Low	Terrace flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 64	-- 20	-- 16	-- SL	-- 48	-- 24	-- 16	-- 8	-- SC	-- 0.64	2.67
49B	5460I	202432	High	Lower slope	3	Tall scrub savanna	Undisturbed	0-6 6-12	-- 57	-- 18	-- 25	-- SCL	-- 46	-- 34	-- 17	-- 17	-- SC	-- 1.10	--
49C	5460I	203431	High	Upper slope	2	Tall scrub savanna	Undisturbed	0-6 6-12	-- 70	-- 21	-- 9	-- SL	-- 45	-- 16	-- 15	-- 1	-- SM	-- 0.46	--
49D	5460I	204429	High	Upland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	-- 78	-- 19	-- 3	-- LS	-- 35	-- --	-- --	-- NP	-- SM	-- 0.64	2.64
50A	5460I	235363	Low	Drainage ditch	0	Savanna	Undisturbed	0-6 6-12	-- 95	-- 4	-- 1	-- S	-- 5	-- --	-- --	-- NP	-- SP-SM	-- 0.28	--

(Continued)

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Table A2 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Depth to Water Table in.			
				MC, %	CI	RI	NCI		c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi	Tan $\phi$ ur		MC, %	CI	RI	NCI		c <sub>u</sub> psi	Tan $\phi$ u	c <sub>ur</sub> psi
40B	1	0-6 6-12	83.0 83.2	27.0 23.6	122 155	-- 0.67	-- 104	0.4	0.34	0.6	0.32										
40C	1	0-6 6-12	84.9 87.6	22.0 16.5	155 345	-- --	-- --	0.3	0.42	0.3	0.47										
40D	1	0-6 6-12	77.1 90.1	37.4 28.0	61 91	-- 0.48	-- 44	0.5	0.40	0.2	0.30										
41A	1	0-6 6-12	95.7 --	20.3 18.3	126 199	-- --	-- --	0.8	0.58	0.0	0.49										
41B	1	0-6 6-12	100.2 86.8	16.8 16.0	166 264	-- --	-- --	0.6	0.55	0.0	0.49										
41C	1	0-6 6-12	98.3 99.2	21.8 21.0	108 185	-- 0.58	-- 107	1.8	0.22	0.7	0.27	98.3 99.2	21.8 21.0	108 185	-- 0.58	-- 107	-- --	-- --	-- --	-- --	9.0
41D	1	0-6 6-12	-- --	13.0 15.9	277 293	-- --	-- --	0.0	0.36	0.9	0.27										
42A	1	0-6 6-12	-- --	11.5 8.5	218 518+	-- --	-- --	0.5	0.27	0.4	0.18	-- --	11.5 8.5	218 518+	-- --	-- --	0.5	0.27	0.4	0.18	+3.0
42B	1	0-6 6-12	-- --	6.4 6.6	212 482+	-- --	-- --	0.3	0.32	0.8	0.18										
42C	1	0-6 6-12	-- --	7.9 9.0	467+ 668+	-- --	-- --	0.0	0.51	0.0	0.32										
42D	1	0-6 6-12	-- --	16.3 12.7	228+ 567+	-- --	-- --	0.3	0.28	0.2	0.16	-- --	16.3 12.7	228+ 567+	-- --	-- --	0.3	0.28	0.2	0.16	+5.0
43A	1	0-6 6-12	-- --	13.4 9.0	166 472+	-- --	-- --	0.5	0.34	0.2	0.28										
43B	1	0-6 6-12	-- --	6.7 7.2	193 224	-- --	-- --	0.0	0.49	0.7	0.36										
43C	1	0-6 6-12	104.7 108.8	14.7 15.0	113 112	-- 0.45	-- 50	0.4	0.30	0.6	0.23	104.7 108.8	14.7 15.0	113 112	-- 0.45	-- 50	-- --	-- --	-- --	-- --	9.0
43D	1	0-6 6-12	-- --	28.1 13.3	351+ 713+	-- --	-- --	0.0	0.36	0.0	0.32	-- --	28.1 13.3	351+ 713+	-- --	-- --	0.0	0.36	0.0	0.32	+3.0
44A	1	0-6 6-12	98.9 100.7	22.4 22.2	93 159	-- 0.84	-- 134	-- --	-- --	-- --	-- --	98.9 100.7	22.4 22.2	93 159	-- 0.84	-- 134	-- --	-- --	-- --	-- --	+9.0
44B	1	0-6 6-12	97.9 99.0	18.8 18.3	111 244	-- 0.41	-- 98	0.0	0.23	0.0	0.20	97.9 99.0	18.8 18.3	111 244	-- 0.41	-- 98	0.0	0.23	0.0	0.20	+1.0
44C	1	0-6 6-12	97.6 --	15.0 17.5	197 348	-- 0.53	-- 184	0.3	0.47	0.0	0.38										
44D	1	0-6 6-12	-- --	12.4 15.4	205 269	-- --	-- --	1.4	0.38	0.3	0.38										
44E	1	0-6 6-12	97.6 101.5	12.1 11.7	231 236	-- 0.67	-- 158	0.7	0.40	0.2	0.36										
44F	1	0-6 6-12	97.3 105.5	25.2 18.8	127 143	-- 0.47	-- 67	-- --	-- --	-- --	-- --	97.3 105.5	25.2 18.8	127 143	-- 0.47	-- 67	-- --	-- --	-- --	-- --	+5.0
47A	1	0-6 6-12	79.6 --	19.8 19.1	243 336	-- 1.03	-- 346	0.0	0.53	0.5	0.36										
47E	1	0-6 6-12	-- --	19.1 22.5	313 310	-- --	-- --	-- --	-- --	-- --	-- --										
48C	1	0-6 6-12	98.0 97.3	3.3 4.6	387 431	-- --	-- --	0.6	0.32	1.7	0.23										
48D	1	0-6 6-12	94.6 90.6	6.4 6.8	403 548+	-- --	-- --	0.5	0.34	0.0	0.36										
Khan Koon Area																					
49A	1	0-6 6-12	104.2 94.2	15.2 22.8	76 81	-- 0.51	-- 41	0.0	0.42	0.0	0.30	104.2 94.2	15.2 22.8	76 81	-- 0.51	-- 41	-- --	-- --	-- --	-- --	3.0
49B	1	0-6 6-12	100.6 96.2	19.7 23.2	99 142	-- 0.75	-- 107	1.3	0.38	0.0	0.40										
49C	1	0-6 6-12	98.1 99.6	16.2 19.1	133 117	-- 0.48	-- 56	0.0	0.45	0.2	0.32										
49D	1	0-6 6-12	98.7 95.1	17.0 19.8	88 89	-- 0.22	-- 20	0.2	0.47	0.4	0.32										
50A	1	0-6 6-12	99.9 96.8	22.3 23.0	26 75	-- 0.82	-- 62	0.8	0.20	0.5	0.12	99.9 96.8	22.3 23.0	26 75	-- 0.82	-- 62	0.8	0.20	0.5	0.12	0.0

(Continued)

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Table A2 (Continued)

Section A. Site Data									Section B. Soil Data										
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Or-ganic Con-tent %	Spe-cific Grav-ity	
	Map Sheet	Grid Coordi-nates							Texture by Wt. %		Type	By Wt % Fines	Atter-berg Limits			Type			
									Sand	Silt			Clay	LL	PL				PI
50B	5460I	235362	High	Lower slope	3	Woodland	Undisturbed	0-6 6-12	-- 87	-- 12	-- 1	-- S	-- 33	-- --	-- --	-- NP	-- SH	-- 0.31	-- --
50C	5460I	236361	High	Upper slope	2	Savanna	Undisturbed	0-6 6-12	-- 85	-- 13	-- 2	-- LS	-- 25	-- --	-- --	-- NP	-- SH	-- 0.43	-- --
50D	5460I	237358	High	Upland flat	0	Woodland	Undisturbed	0-6 6-12	-- 87	-- 11	-- 2	-- S	-- 26	-- --	-- --	-- NP	-- SH	-- 0.23	-- --
51A	5560I	673366	Low	Terrace flat	0	Tall-grass prairie	Cultivated (rice)	0-6 6-12	-- 69	-- 18	-- 13	-- SL	-- 43	-- 18	-- 16	-- 2	-- SH	-- 0.28	-- 2.67
51B	5560I	674365	High	Lower slope	4	Woodland	Undisturbed	0-6 6-12	-- 86	-- 13	-- 1	-- S	-- 28	-- --	-- --	-- NP	-- SH	-- 0.46	-- --
51C	5560I	675363	High	Upper slope	3	Woodland	Undisturbed	0-6 6-12	-- 82	-- 17	-- 1	-- LS	-- 36	-- --	-- --	-- NP	-- SH	-- 0.46	-- --
51D	5560I	676361	High	Upland flat	0	Woodland	Undisturbed	0-6 6-12	-- 86	-- 13	-- 1	-- S	-- 27	-- --	-- --	-- NP	-- SH	-- 0.78	-- --
52A	5560I	687288	Low	Terrace slope	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 34	-- 45	-- 21	-- L	-- 80	-- 29	-- 17	-- 12	-- CL	-- 0.62	-- 2.68
52B	5560I	688285	Low	Terrace slope	2	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 34	-- 42	-- 24	-- L	-- 79	-- 32	-- 16	-- 16	-- CL	-- 0.76	-- --
52C	5560I	689281	Low	Terrace slope	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 44	-- 40	-- 16	-- L	-- 71	-- 24	-- 18	-- 6	-- CL-ML	-- 0.50	-- --
52D	5560I	689279	Low	Terrace flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 58	-- 34	-- 8	-- SL	-- 56	-- 16	-- --	-- NP	-- ML	-- 0.64	-- 2.65
53A	5560III	425232	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 65	-- 16	-- 19	-- SL	-- 52	-- 34	-- 17	-- 17	-- CL	-- 1.10	-- --
53B	5560III	427231	High	Lower slope	4	Woodland	Undisturbed	0-6 6-12	-- 79	-- 18	-- 3	-- LS	-- 37	-- --	-- --	-- NP	-- SH	-- 0.62	-- 2.64
53C	5560III	428231	High	Upper slope	4	Short-grass prairie	Logged	0-6 6-12	-- 77	-- 16	-- 7	-- SL	-- 35	-- --	-- --	-- NP	-- SH	-- 0.78	-- --
53D	5560III	429231	High	Upper ridge	0	Savanna	Logged	0-6 6-12	-- 84	-- 14	-- 2	-- LS	-- 28	-- --	-- --	-- NP	-- SH	-- 0.38	-- --
53E	5560III	429230	High	Upland flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 84	-- 12	-- 4	-- LS	-- 32	-- --	-- --	-- NP	-- SH	-- 0.62	-- --
54A	5560III	534198	Low	Terrace slope	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 38	-- 29	-- 33	-- CL	-- 72	-- 37	-- 16	-- 21	-- CL	-- 0.55	-- --
54B	5560III	530198	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 54	-- 24	-- 22	-- SCL	-- 57	-- 32	-- 14	-- 18	-- CL	-- 0.55	-- --
54C	5560III	529197	Low	Terrace slope	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 70	-- 21	-- 9	-- SL	-- 46	-- 16	-- 15	-- 1	-- SH	-- 0.46	-- --
54D	5560III	527196	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 84	-- 12	-- 4	-- LS	-- 33	-- --	-- --	-- NP	-- SH	-- 0.38	-- --
55A	5560III	903187	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6 6-12	-- 85	-- 11	-- 4	-- LS	-- 30	-- --	-- --	-- NP	-- SH	-- 0.55	-- 2.64
55B	5560III	903188	Low	Terrace slope	3	Woodland	Grazed	0-6 6-12	-- 77	-- 15	-- 8	-- SL	-- 38	-- --	-- --	-- NP	-- SH	-- 1.10	-- --
55C	5560III	903188	Low	Terrace slope	2	Woodland	Grazed	0-6 6-12	-- 83	-- 12	-- 5	-- LS	-- 31	-- --	-- --	-- NP	-- SH	-- 0.62	-- --
55D	5560III	904189	Low	Terrace slope	2	Tall-grass prairie	Grazed	0-6 6-12	-- 80	-- 14	-- 6	-- LS	-- 37	-- --	-- --	-- NP	-- SH	-- 1.24	-- --
56A	5560II	749173	Low	Terrace slope	1	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 41	-- 35	-- 24	-- L	-- 68	-- 32	-- 17	-- 15	-- CL	-- 0.92	-- --
56B	5560II	748173	Low	Terrace flat	0	Short-grass prairie	Lawn	0-6 6-12	-- 41	-- 35	-- 24	-- L	-- 74	-- 32	-- 17	-- 15	-- CL	-- 0.78	-- --
56C	5560II	748172	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 44	-- 33	-- 23	-- L	-- 66	-- 29	-- 18	-- 11	-- CL	-- 1.24	-- --
56D	5560II	747172	Low	Terrace slope	1	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 52	-- 27	-- 21	-- SCL	-- 64	-- 27	-- 17	-- 10	-- CL	-- 1.24	-- --

(Continued)

(15 of 16 sheets)

Table A2 (Concluded)

Section C. Trafficability Data																					
Wet-Season Condition											High-Moisture Condition										
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, % CI				Sheargraph				Dry Density lb/cu ft	MC, % CI				Sheargraph				Depth to Water Table in.
				MC	%	CI	RI	RCI	c <sub>u</sub> psi	Tan $\beta_u$	$\alpha_{ur}$ psi		Tan $\alpha_{ur}$	MC	%	CI	RI	RCI	c <sub>u</sub> psi	Tan $\beta_u$	
50B	1	0-6 6-12	92.8 92.8	20.7 19.9	139 157	— 0.62	— 97	0.0	0.36	0.3	0.34										
50C	1	0-6 6-12	96.5 92.3	17.5 19.9	129 139	— 0.58	— 81	0.8	0.42	0.5	0.42										
50D	1	0-6 6-12	94.2 95.0	18.5 19.0	140 122	— 0.63	— 77	0.5	0.34	0.2	0.34										
51A	1	0-6 6-12	102.6 104.2	20.3 18.4	58 84	— 0.39	— 33	0.3	0.34	0.7	0.30	102.6 104.2	20.3 18.4	58 84	— 0.39	— 33	—	—	—	—	1.0
51B	1	0-6 6-12	95.9 91.2	15.4 8.0	117 140	— 1.57	— 220	0.0	0.40	0.0	0.38										
51C	1	0-6 6-12	97.2 94.2	14.8 10.9	133 153	— 1.13	— 173	0.0	0.42	0.4	0.32										
51D	1	0-6 6-12	92.3 89.9	14.2 6.6	101 143	— 1.31	— 187	0.0	0.38	0.0	0.36										
52A	1	0-6 6-12	103.3 93.8	20.4 25.5	46 64	— 0.67	— 43	1.0	0.16	0.2	0.18	103.3 93.8	20.4 25.5	46 64	— 0.67	— 43	1.0	0.16	0.2	0.18	+0.5
52B	1	0-6 6-12	102.0 93.4	20.0 25.3	105 79	— 0.68	— 54	0.0	0.36	0.6	0.27	102.0 93.4	20.0 25.3	105 79	— 0.68	— 54	—	—	—	—	3.0
52C	1	0-6 6-12	99.3 94.9	22.6 27.3	85 113	— 0.72	— 81	0.6	0.22	0.4	0.30	99.3 94.9	22.6 27.3	85 113	— 0.72	— 81	0.6	0.22	0.4	0.30	+1.0
52D	1	0-6 6-12	93.9 98.0	18.8 17.4	63 92	— 0.51	— 47	0.0	0.47	0.2	0.36										
53A	1	0-6 6-12	94.7 96.7	22.9 23.1	158 114	— 0.82	— 93	0.6	0.38	0.2	0.30										
53B	1	0-6 6-12	98.5 97.3	11.1 12.0	184 250	— 1.62	— 405	0.4	0.45	0.2	0.28										
53C	1	0-6 6-12	92.8 99.0	11.3 10.8	119 174	— 1.23	— 214	0.1	0.40	0.0	0.36										
53D	1	0-6 6-12	91.1 89.6	12.3 9.1	84 111	— 2.02	— 224	0.6	0.32	0.7	0.32										
53E	1	0-6 6-12	91.1 90.0	7.6 8.7	98 128	— 2.05	— 262	0.2	0.45	0.0	0.40										
54A	1	0-6 6-12	97.4 97.9	26.9 25.8	94 134	— 0.93	— 125	0.8	0.23	0.0	0.34	97.4 97.9	26.9 25.8	94 134	— 0.93	— 125	—	—	—	—	2.0
54B	1	0-6 6-12	107.2 104.6	18.9 21.0	46 63	— 0.73	— 46	—	—	—	—	107.2 104.6	18.9 21.0	46 63	— 0.73	— 46	—	—	—	—	+2.0
54C	1	0-6 6-12	105.8 105.8	16.1 13.7	128 120	— 0.31	— 37	0.0	0.40	0.3	0.36	105.8 105.8	16.1 13.7	128 120	— 0.31	— 37	—	—	—	—	1.5
54D	1	0-6 6-12	97.4 98.3	19.2 16.4	115 143	— 1.03	— 147	0.7	0.47	0.3	0.38	97.4 98.3	19.2 16.4	115 143	— 1.03	— 147	—	—	—	—	6.0
55A	1	0-6 6-12	90.3 98.9	26.8 16.2	153 206	— 0.56	— 115	—	—	—	—	90.3 98.9	26.8 16.2	153 206	— 0.56	— 115	—	—	—	—	+1.0
55B	1	0-6 6-12	104.5 102.5	13.7 15.1	143 133	— 0.42	— 56	0.9	0.47	0.2	0.36										
55C	1	0-6 6-12	99.7 99.2	10.8 12.1	117 162	— —	— —	0.0	0.42	0.0	0.36										
55D	1	0-6 6-12	94.7 97.3	7.4 10.4	130 170	— 1.99	— 338	0.3	0.40	0.0	0.34										
56A	1	0-6 6-12	93.3 95.5	23.5 24.1	106 141	— 0.76	— 107	1.2	0.27	0.4	0.12	93.3 95.5	23.5 24.1	106 141	— 0.76	— 107	1.2	0.27	0.4	0.12	0.0
56B	1	0-6 6-12	103.2 95.2	19.1 25.3	132 105	— 0.54	— 57	1.0	0.27	0.0	0.18	103.2 95.2	19.1 25.3	132 105	— 0.54	— 57	1.0	0.27	0.0	0.18	0.0
56C	1	0-6 6-12	96.3 91.7	21.1 26.1	86 103	— 0.45	— 46	0.6	0.30	0.4	0.20	96.3 91.7	21.1 26.1	86 103	— 0.45	— 46	0.6	0.30	0.4	0.20	+1.0
56D	1	0-6 6-12	97.2 90.9	20.8 26.2	58 103	— 0.54	— 56	1.1	0.16	0.0	0.27	97.2 90.9	20.8 26.2	58 103	— 0.54	— 56	1.1	0.16	0.0	0.27	0.0

Table A3  
Surface Composition Study  
Summary of Site, Soil, and Trafficability Data

Section A. Site Data										Section B. Soil Data										
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Type	Organic Content %	Specific Gravity	
	Map Sheet	Grid Coordinates							Texture by Wt. %			By Wt %	Atter-berg Limits							
									Sand	Silt	Clay		Fines	LL	PL	PI				
Nakhon Si Thammarat Area																				
1T-1	5057IV	313312	Low	Bottomland flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	45 45	34 34	21 21	L L	62 62	32 32	18 18	14 14	CL CL	-- --	-- --	
1T-2	5058III	115380	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	72 72	21 21	7 7	SL SL	34 34	14 14	14 14	0 0	SM SM	-- --	-- --	
1T-3	4958I	935603	Low	Bottomland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	43 43	40 40	17 17	L L	65 65	30 30	17 17	13 13	CL CL	-- --	-- --	
1T-4	4958I	830660	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	74 59	14 19	12 22	SL SCL	31 45	-- 18	-- 10	-- 8	NP SC	SM SC	-- --	
1T-5	5058III	190350	Low	Bottomland depression	0	Tall scrub woodland	Undisturbed	0-6 6-12	6 3	34 29	60 68	C C	98 99	60 63	30 30	30 33	CH CH	-- --	-- --	
1T-6	5058III	145345	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	31 26	37 44	32 30	GCL CL	60 74	35 37	20 23	15 14	CL CL	-- --	-- --	
1T-7	5058III	155355	Low	Bottomland flat	0	Low scrub savanna	Undisturbed	0-6 6-12	77 66	11 16	12 18	SL SL	25 38	-- 21	-- 14	-- 7	NP SM-SC	SM SM	-- --	
1T-8	5058III	160345	Low	Bottomland flat	0	Low scrub savanna	Undisturbed	0-6 6-12	49 45	34 36	17 19	L L	61 66	28 29	21 20	7 9	CL-ME CL	-- --	-- --	
1T-9	4958I	908652	Low	Bottomland depression	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	26 22	48 41	26 37	CL CL	82 84	36 50	19 21	17 29	CL CH	0.58 0.55	-- --	
1T-10	4958I	849672	Low	Bottomland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	29 28	51 50	20 22	SIL SIL	82 81	28 25	20 17	8 8	CL CL	3.06 2.24	-- --	
1T-11	5057IV	210320	Low	Bottomland flat	3	Short-grass prairie	Grazed	0-6 6-12	59 49	33 34	8 17	SL L	45 52	18 25	14 15	4 10	SM CL	0.59 0.90	-- --	
1T-12	5077IV	210260	Low	Bottomland flat	2	Tall scrub savanna	Cultivated (idle)	0-6 6-12	25 24	34 36	41 40	C CL	81 82	71 70	23 23	48 47	CH CH	2.81 2.24	-- --	
1T-13	5051IV	230140	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	39 36	53 54	8 10	SIL SIL	80 79	-- 23	-- 19	-- 4	-- CL-ME	1.90 1.49	-- --	
1T-15	5057IV	200140	Low	Natural levee	0	Woodland	Cultivated	0-6 6-12	39 39	42 42	19 19	L L	76 76	36 36	26 26	10 10	ML ML	5.36 5.36	-- --	
1T-16	5057IV	200163	Low	Bottomland depression	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	76 55	10 17	14 28	SL SCL	26 49	-- 42	-- 18	-- 24	NP SC	SM SC	0.50 0.96	-- --
1T-17	5057IV	210190	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	37 37	36 36	27 27	L L	70 70	29 29	16 16	13 13	CL CL	1.79 1.79	-- --	
1T-18	4958II	835425	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	80 59	14 29	6 12	LS SL	32 51	16 17	14 13	2 4	SM CL-ME	0.43 0.45	-- --	
1T-19	4958II	863437	Low	Bottomland flat	0	Tall scrub savanna	Cultivated (rice)	0-6 6-12	49 49	38 38	13 13	L L	65 66	26 25	19 17	7 8	CL-ME CL	1.24 0.85	-- --	
1T-21	5057IV	261201	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	67 60	23 27	10 13	SL SL	44 46	-- 21	-- 12	-- 9	-- SC	0.93 0.45	-- --	
1T-22	5057IV	294178	Low	Bottomland flat	0	Low scrub savanna	Logged	0-6 6-12	57 57	29 29	14 14	SL SL	44 44	20 20	15 15	5 5	SM-SC SM-SC	0.77 0.77	-- --	
1T-23	5057I	576207	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	69 63	19 19	12 18	SL SL	39 45	20 23	10 12	10 11	SC SC	1.14 0.59	-- --	
1T-24	5057I	570220	Low	Bottomland flat	3	Tall scrub savanna	Undisturbed	0-6 6-12	83 78	11 10	6 12	LS SL	19 22	-- 11	-- 12	-- 0	-- SM	0.55 0.38	-- --	
1T-25	5057I	528246	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	45 46	42 40	13 14	L L	60 54	-- 25	-- 14	-- 11	-- CL	1.25 0.72	-- --	
1T-26	5057I	510250	Low	Bottomland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	50 50	28 29	22 21	L L	47 46	-- 37	-- 14	-- 23	-- SC	0.87 0.70	-- --	
1T-27	5057I	450235	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	20 19	42 36	38 45	SIL C	87 88	-- 82	-- 25	-- 57	-- CH	0.23 0.70	-- --	
1T-28	5057I	350290	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	58 57	21 20	21 23	SCL SCL	49 51	-- 34	-- 16	-- 18	-- CL	0.61 0.49	-- --	
19GT-20	4958I	909526	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	48 30	38 32	14 38	L CL	63 78	-- 39	-- 18	-- 21	-- CL	0.59 0.55	-- --	
19GT-23	4958II	900426	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	51 53	31 31	18 16	L SL	58 58	-- 22	-- 15	-- 7	-- CL-ME	1.56 0.83	-- --	
19GT-27	4958II	997446	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	74 56	19 17	7 27	SL SCL	36 52	-- 28	-- 13	-- 15	-- CL	0.67 0.74	-- --	

(Continued)

\* 0 = gravelly; VU = very gravelly.

(1 of 16 sheets)



Table A3 (Continued)

Section C. Frictionability Data																					
Wet-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Shearograph**				Dry Density lb/cu ft	Shearograph**				Depth to Water Table? in.								
				ME, %	CI	RI	RCI		c <sub>u</sub> psi	φ <sub>u</sub> deg	a <sub>ur</sub> psi	tan α <sub>ur</sub> deg		c <sub>u</sub> psi	φ <sub>u</sub> deg	a <sub>ur</sub> psi	tan α <sub>ur</sub> deg				
Hobbs Farm Area																					
1T-1	2	0-6 6-12	-- --	6.6 7.3	404 504	-- --	-- --	0.5	0.74	0.3	0.53										
1T-2	2	0-6 6-12	-- --	15.9 14.8	138 270+	-- --	-- --	0.6	0.46	1.2	0.40	-- --	15.9 14.8	98 239+	-- --	-- --	1.0	0.67	0.0	0.45	+3
1T-3	2	0-6 6-12	-- --	10.1 14.0	257 414	-- --	-- --	0.0	0.81	1.0	0.54										
1T-4	2	0-6 6-12	-- --	14.3 17.4	178 266	-- 0.97	-- 202	0.9	0.78	0.3	0.49	-- --	14.3 17.4	121 208	-- 0.97	-- 202	0.9	0.78	0.0	0.51	+6
1T-5	2	0-6 6-12	-- --	35.9 24.4	78 208	0.91 0.69	55 192	2.6	0.60	0.9	0.41	-- --	35.9 24.4	60 278	0.91 0.69	55 192	1.2	0.84	0.9	0.55	+5
1T-6	2	0-6 6-12	-- --	17.4 13.0	98 344+	0.45 --	46 --	2.4	0.70	0.4	0.62	-- --	17.4	103	0.45	46	0.9	0.73	0.9	0.65	+4
1T-7	2	0-6 6-12	-- --	16.3 12.6	354 470	-- --	-- --	2.8	0.54	0.7	0.49										
1T-8	2	0-6 6-12	-- --	22.9 9.7	191 390+	-- --	-- --	2.6	0.48	0.4	0.50										
1T-9	2	0-6 6-12	-- --	22.0 14.8	90 206	0.38 0.88	37 211	4.3	0.42	0.3	0.75	-- --	22.0 14.8	98 240	0.38 0.88	37 211	4.3	0.42	0.3	0.75	+4
1T-10	2	0-6 6-12	-- --	19.7 18.5	94 122	0.58 1.12	71 171	2.1	0.40	1.2	0.28	-- --	19.7 18.5	122 153	0.58 1.12	71 171	2.0	0.18	1.2	0.14	+3
1T-11	2	0-6 6-12	-- --	10.1 7.9	362+ 674+	-- --	-- --	1.6	0.76	0.2	0.53										
1T-12	2	0-6 6-12	-- --	18.8 14.1	150 305	-- --	-- --	2.8	0.64	1.1	0.58										
1T-13	2	0-6 6-12	-- --	19.9 17.8	142 276	-- --	-- --	0.7	0.50	0.8	0.35	-- --	-- --	111 186	-- --	-- --	1.2	0.34	0.9	0.36	+3
1T-15	2	0-6 6-12	-- --	10.1 8.2	458 586	-- --	-- --	1.0	0.72	0.1	0.60										
1T-16	2	0-6 6-12	-- --	25.0 24.3	294 420	-- --	-- --	2.0	0.37	0.9	0.44										
1T-17	2	0-6 6-12	-- --	32.7 28.2	214 420	0.52 0.71	39 227	1.7	0.74	0.6	0.52	-- --	32.7 28.2	75 320	0.52 0.71	39 227	1.4	0.75	0.4	0.47	+4
1T-18	2	0-6 6-12	-- --	7.1 10.0	388 590+	-- --	-- --	1.8	0.52	0.8	0.45	-- --	-- --	227 458	-- --	-- --	1.6	0.34	1.0	0.32	+4
1T-19	1	0-6 6-12	-- --	-- --	119 170	-- --	-- --	3.2	0.14	1.0	0.42										
1T-21	2	0-6 6-12	-- --	33.8 28.4	67 130	1.14 0.83	73 131	2.4	0.44	0.8	0.46	-- --	33.8 28.4	64 158	1.14 0.83	73 131	2.4	0.28	1.4	0.22	+3
1T-22	2	0-6 6-12	-- --	11.6 10.1	250 299+	-- --	-- --	2.4	0.58	1.4	0.50										
1T-23	2	0-6 6-12	-- --	4.9 6.7	412+ 424+	-- --	-- --	1.6	0.50	1.0	0.50										
1T-24	2	0-6 6-12	-- --	2.8 3.0	444+ 480+	-- --	-- --	1.6	0.35	0.6	0.47										
1T-25	2	0-6 6-12	-- --	25.7 20.6	58 127	1.49 1.06	54 125	3.0	0.60	1.0	0.45	-- --	25.7 20.6	36 118	1.49 1.06	54 125	1.9	0.49	1.9	0.23	+3
1T-26	2	0-6 6-12	-- --	16.6 18.8	122 217	1.40 1.17	294 378	2.6	0.29	2.0	0.25	-- --	16.6 18.8	210 323	1.40 1.17	294 378	2.2	0.55	2.0	0.36	+4
1T-27	2	0-6 6-12	-- --	18.2 24.4	113 177	1.32 1.19	142 171	1.8	0.66	0.4	0.46										
1T-28	2	0-6 6-12	-- --	43.6 27.8	52 156	0.90 0.73	27 98	2.4	0.76	1.7	0.52										
196T-20	2	0-6 6-12	-- --	9.0 9.7	288 473	-- --	-- --	2.4	0.66	0.5	0.66										
196T-23	2	0-6 6-12	-- --	5.3 5.4	434+ 464+	-- --	-- --	2.0	0.42	0.1	0.46	-- --	-- --	118 178	-- --	-- --	2.4	0.38	0.2	0.47	+3
196T-27	2	0-6 6-12	-- --	5.5 8.2	248 428+	-- --	-- --	1.6	0.44	0.2	0.47										

(Continued)

\*\* c<sub>u</sub>, ultimate soil-to-soil cohesion; φ<sub>u</sub>, ultimate soil-to-soil angle of internal friction; a<sub>ur</sub>, ultimate soil-to-rubber adhesion;φ<sub>ur</sub>, ultimate soil-to-rubber angle of friction.

† Plus (+) denotes depth of water above surface.

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Table A3 (Continued)

Section A. Site Data									Section B. Soil Data										
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	UNDA				U.S. Atter-berg Limits				Type	Or-ganic Content %	Spe-cific Gravity
	Map Sheet	Grid Coor-di-nates							Texture by Wt. %				By Wt %	Limits					
									Sand	Silt	Clay	Type		Fines	LL	PL			
19GT-30	5057IV	233146	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	58 40	36 46	6 14	SL L	49 67	— 16	— 12	— 4	— CL-ML	0.45 0.28	— —
Low Marsh Area																			
2T-1	5153IV	825794	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	6 6	62 62	32 32	S1CL S1CL	96 96	61 61	23 23	38 38	CH CH	— —	2.65 2.65
2T-2	5153IV	715743	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	14 14	59 59	27 27	S1CL S1CL	90 90	57 57	29 29	28 28	CH CH	— —	2.52 2.52
2T-3	5153IV	750830	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	5 5	65 65	30 30	S1CL S1CL	97 97	64 64	30 30	34 34	CH CH	— —	2.50 2.50
2T-4	5153IV	786804	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	15 18	50 48	35 34	S1CL S1CL	89 86	62 60	27 26	35 34	CH CH	— —	2.69 2.76
2T-5	5154I	085175	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	24 24	69 69	7 7	S1L S1L	83 83	31 31	18 18	13 13	CL CL	— —	2.64 2.64
2T-6	5154I	100135	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	26 25	62 60	12 15	S1L S1L	78 74	58 62	23 23	35 39	CH CH	— —	2.75 2.74
2T-7	5154I	080117	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	24 24	66 66	10 10	S1L S1L	83 83	40 40	18 18	22 22	CL CL	— —	2.69 2.69
2T-8	5154I	142114	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	7 8	65 53	28 39	S1CL S1CL	96 94	57 61	29 29	28 32	CH CH	— —	2.69 2.71
2T-9	5154I	040210	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	25 25	65 65	10 10	S1L S1L	82 82	36 36	21 21	15 15	CL CL	— —	2.68 2.68
2T-10	5154I	070080	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	40 40	55 55	5 5	S1L S1L	56 56	17 17	15 15	2 2	ML ML	— —	2.75 2.75
2T-11	5154II	080990	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	55 59	39 35	6 6	SL SL	53 49	— —	— —	— —	ML ML	— —	2.63 2.60
2T-12	5154II	000000	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	35 35	54 54	11 11	S1L S1L	73 73	25 25	19 19	6 6	CL-ML CL-ML	— —	2.64 2.64
2T-13	5154II	970933	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	21 21	48 44	31 33	CL CL	84 83	42 43	26 25	16 18	CL CL	— —	2.63 2.63
2T-14	5154II	000930	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	20 15	61 4	19 31	S1L S1CL	85 89	28 41	19 23	9 18	CL CL	— —	2.64 2.68
2T-15	5154II	020875	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	6 17	60 58	34 30	S1CL S1CL	96 92	46 45	26 25	20 20	CL CL	— —	2.68 2.73
2T-16	5154II	050860	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	8 8	67 67	25 25	S1L S1L	94 94	53 53	25 25	28 28	CH CH	— —	2.65 2.65
2T-17	5154III	850985	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	12 12	69 69	19 19	S1L S1L	96 96	45 45	22 22	23 23	CL CL	— —	2.67 2.67
2T-18	5154III	211945	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	7 7	69 69	24 24	S1L S1L	96 96	49 49	25 25	24 24	CL CL	— —	2.68 2.68
2T-19	5154III	793905	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	16 16	64 64	20 20	S1L S1L	89 89	44 44	20 20	24 24	CL CL	— —	2.67 2.67
2T-20	5154IV	970130	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	13 13	65 65	22 22	S1L S1L	93 93	62 62	25 25	37 37	CH CH	— —	2.59 2.59
2T-21	5155II	913260	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	39 39	51 51	10 10	S1L S1L	70 70	59 59	32 32	27 27	ML ML	— —	2.63 2.63
2T-22	5155II	935370	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	34 34	59 59	7 7	S1L S1L	74 74	29 29	18 18	11 11	CL CL	— —	2.63 2.63
2T-23	5155II	010240	Low	Bottomland depression	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	46 33	42 49	12 18	L L	54 73	28 37	18 18	10 19	CL CL	— —	2.67 2.65
2T-24	5155III	680400	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	10 10	54 54	36 36	S1CL S1CL	93 93	92 92	29 29	63 63	CH CH	— —	2.56 2.56
2T-25	5155III	680380	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	9 9	66 66	25 25	S1CL S1CL	95 95	47 47	26 26	21 21	CL CL	— —	2.65 2.65
2T-26	5155III	820290	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	22 22	59 59	19 19	S1L S1L	87 87	86 86	42 42	44 44	ML ML	— —	2.58 2.58
2T-27	5155IV	780470	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6 6-12	25 25	64 64	11 11	S1L S1L	82 82	51 51	20 20	31 31	CH CH	— —	2.61 2.61
2T-28	5155IV	803437	Low	Bottomland flat	5	Tall-grass prairie	Undisturbed	0-6 6-12	36 36	56 56	8 8	S1L S1L	70 70	50 50	24 24	26 26	CH CH	— —	2.60 2.60
2T-29	5155IV	780420	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	26 26	65 65	9 9	S1L S1L	80 80	36 36	17 17	19 19	CL CL	— —	2.57 2.57

(Continued)

(3 of 16 sheets)

Table A3 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	ME, %	Sheargraph				Dry Density lb/cu ft	ME, %	Sheargraph				Depth to Water Table in.	
				MC, %	CI	RI	RCI			c <sub>u</sub> psi	Tan $\phi$ u	c <sub>u</sub> psi	Tan $\phi$ u			MC, %	CI	RI	RCI		c <sub>u</sub> psi
150T-30	2	0-6 6-12	-- --	19.2 33.5	230 280	-- --	-- --	1.6	0.58	0.6	0.56	-- --	-- --	190 330	-- --	-- --	1.0	0.55	1.0	0.45	+6
Low Moist Area																					
2T-1	3	0-6 6-12	-- --	33.6 32.4	69 117	1.15 1.10	82 125	1.6	0.68	2.3	0.36										
2T-2	3	0-6 6-12	-- --	28.3 28.4	100 123	0.88 0.86	98 120	1.4	0.68	1.7	0.49										
2T-3	3	0-6 6-12	-- --	35.2 38.8	87 116	1.04 1.06	67 113	1.2	0.49	1.9	0.81										
2T-4	3	0-6 6-12	-- --	31.8 31.5	124 120	1.19 1.02	112 122	1.0	0.70	1.4	0.35										
2T-5	2	0-6 6-12	-- --	23.0 18.3	167+ 192+	1.36 1.06	46 90	0.6	0.78	0.8	0.51	-- --	23.0 18.3	34 85	1.36 1.06	46 90	0.6	0.78	0.8	0.51	+2
2T-6	1	0-6 6-12	-- --	35.2 29.6	57 98	1.20 0.90	40 65	0.5	0.84	1.6	0.42	-- --	37.7 29.9	25 67	1.34 0.90	39 60	-- --	-- --	-- --	-- --	
2T-7	3	0-6 6-12	-- --	29.6 24.2	120 202	0.94 0.98	142 238	0.0	1.00	0.4	0.65	-- --	35.0 27.8	30 105	0.73 0.90	22 95	0.0	1.00	0.8	0.55	+4
2T-8	2	0-6 6-12	-- --	-- --	74 125	2.95 1.04	295 161	1.7	0.75	1.0	0.36	-- --	-- --	100 155	2.95 1.04	295 161	1.7	0.75	0.6	0.58	+3
2T-9	2	0-6 6-12	-- --	24.7 32.1	102 170	1.14 1.31	114 282	0.8	0.75	1.5	0.32										
2T-10	2	0-6 6-12	-- --	23.5 21.7	100 150	0.46 0.71	71 121	1.1	0.73	0.8	0.55	-- --	23.5 21.7	155 171	0.46 0.71	71 121	1.1	0.73	0.8	0.55	+3
2T-11	2	0-6 6-12	-- --	24.0 19.8	282 402+	-- --	-- --	1.0	0.31	0.9	0.55	-- --	-- --	167 300+	-- --	-- --	1.0	0.81	0.9	0.55	+6
2T-12	2	0-6 6-12	-- --	24.1 24.4	168 230+	0.93 --	105 --	0.3	1.08	1.2	0.66	-- --	24.1 24.4	113 175	0.93 --	105 --	0.3	1.08	1.2	0.73	+7
2T-13	2	0-6 6-12	-- --	31.2 31.7	166 238	1.90 --	228 --	1.1	0.84	0.8	0.67										
2T-14	2	0-6 6-12	-- --	29.8 27.6	143 282+	-- --	-- --	0.6	0.84	0.8	0.57	-- --	29.8 27.6	112 265	-- --	-- --	0.6	0.84	0.5	0.67	+8
2T-15	2	0-6 6-12	-- --	33.0 29.6	64 160	1.24 1.07	51 124	1.0	0.73	1.0	0.49	-- --	33.0 29.6	41 116	1.24 1.07	51 124	1.0	0.73	0.8	0.62	+6
2T-16	3	0-6 6-12	-- --	32.6 42.6	83 137	0.72 0.82	62 122	0.7	0.70	1.2	0.43	-- --	45.6 51.2	49 117	0.70 0.71	34 83	0.7	0.70	0.8	0.58	+9
2T-17	2	0-6 6-12	-- --	22.7 27.8	106 134	1.17 1.19	81 219	1.6	0.62	0.9	0.53										
2T-18	2	0-6 6-12	-- --	39.6 48.7	55 98	0.84 0.97	34 60	1.9	0.58	1.8	0.34										
2T-19	2	0-6 6-12	-- --	26.4 26.8	140 136	0.90 0.87	148 144	0.6	0.93	0.7	0.75										
2T-20	3	0-6 6-12	-- --	37.6 31.4	81 107	1.36 0.78	71 86	1.7	0.60	1.4	0.44										
2T-21	2	0-6 6-12	-- --	30.1 30.5	107 109	1.60 1.33	184 183	1.9	0.50	1.3	0.36										
2T-22	2	0-6 6-12	-- --	-- --	254 434	-- --	-- --	0.9	0.84	0.4	0.56										
2T-23	3	0-6 6-12	-- --	29.2 27.0	109 186	0.80 1.04	80 222	1.2	0.70	0.7	0.48	-- --	27.6 27.7	85 104	0.77 0.85	65 88	1.2	0.70	1.0	0.49	
2T-24	2	0-6 6-12	-- --	31.8 47.8	54 79	0.81 0.72	53 73	2.0	0.55	1.3	0.42										
2T-25	3	0-6 6-12	-- --	28.6 26.8	352+ 328+	0.68 0.99	26 36	2.0	0.42	1.0	0.72										
2T-26	3	0-6 6-12	-- --	40.3 30.6	81 106	1.14 0.94	84 106	1.2	0.57	1.5	0.36										
2T-27	2	0-6 6-12	-- --	24.0 24.4	88 100	0.69 1.16	52 218	1.1	0.67	0.2	0.51										
2T-28	2	0-6 6-12	-- --	8.0 21.0	284+ 382+	-- --	-- --	1.1	0.73	1.7	0.40										
2T-29	3	0-6 6-12	-- --	19.4 21.3	127 174	0.93 0.78	42 111	0.8	0.73	0.7	0.52										

(Continued)

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Table A3 (Continued)

Section A. Site Data								Section B. Soil Data														
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	UNDA				By Wt %				Atter- berg Limits				Or- ganic Con- tent %	Spe- cific Grav- ity
Site No.	Map Sheet	Grid Coordi- nates							Texture by Wt. %				Fines				LL PL PI Type					
									Sand	Silt	Clay	Type										
2T-30	5155IV	740480	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	63 --	37 --	0 --	SL	46 --	28 --	13 --	13 --	SC	--	--	2.90 --		
2T-31	5155IV	740515	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	40 40	50 50	10 10	SIL SIL	67 67	29 29	13 13	14 14	CL CL	--	--	2.65 2.65		
2T-32	5155IV	720550	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	11 11	58 57	31 32	SIL SIL	93 92	64 61	26 31	38 30	CH CH	--	--	2.56 2.57		
2T-33	5155IV	830510	Low	Bottomland flat	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 75	-- 16	-- 9	-- SL	-- 35	-- --	-- --	-- NP	-- SH	--	--	0.92 --		
2T-34	5155IV	800570	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 55	-- 30	-- 15	-- SL	-- 54	-- 17	-- 12	-- 5	-- CL-ME	--	--	0.32 --		
2T-35	5155III	780372	Low	Bottomland flat	0	Low scrub savanna	Undisturbed	0-6 6-12	-- 72	-- 18	-- 10	-- SL	-- 38	-- --	-- --	-- NP	-- SH	--	--	0.38 --		
2T-36	5154III	734860	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	11 11	72 72	17 17	SIL SIL	94 94	37 37	21 21	16 16	CL CL	--	--	2.63 2.63		
Chieng Mai Area																						
3T-1	4767I	968842	Low	Bottomland flat	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 73	-- 20	-- 7	-- SL	-- 36	-- --	-- --	-- NP	-- SH	--	--	0.47 --		
3T-2	4767I	950891	Low	Natural levee	3	Woodland	Banana orchard	0-6 6-12	-- 37	-- 38	-- 25	-- L	-- 79	-- 39	-- 21	-- 18	-- CL	--	--	1.05 --		
3T-3	4767I	942909	Low	Bottomland flat	1	Tall scrub savanna	Banana orchard	0-6 6-12	-- 60	-- 13	-- 27	-- SCL	-- 49	-- 24	-- 13	-- 11	-- SC	--	--	0.74 --		
3T-6	4867III	220700	Low	Terrace flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 65	-- 22	-- 13	-- SL	-- 43	-- --	-- --	-- NP	-- SH	--	--	0.67 --		
3T-7	4867III	173702	Low	Natural levee	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 40	-- 36	-- 24	-- L	-- 71	-- 38	-- 27	-- 11	-- V-L	--	--	1.77 --		
3T-8	4767I	941909	Low	Bottomland flat	1	Tall scrub savanna	Cultivated (orchard)	0-6 6-12	-- 69	-- 13	-- 18	-- SL	-- 39	-- 24	-- 18	-- 6	-- SH-SC	--	--	0.83 --		
3T-9	4767I	946963	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 50	-- 36	-- 14	-- L	-- 58	-- 31	-- 19	-- 12	-- CL	--	--	2.29 --		
3T-10	4767I	965922	Low	Natural levee	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 28	-- 55	-- 17	-- SIL	-- 85	-- 43	-- 33	-- 12	-- ML	--	--	2.03 --		
3T-11	4867IV	049832	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 76	-- 15	-- 9	-- SL	-- 58	-- 34	-- 25	-- 9	-- ML	--	--	0.62 --		
3T-12	4867IV	027882	Low	Bottomland flat	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 76	-- 20	-- 4	-- LS	-- 38	-- --	-- --	-- NP	-- SH	--	--	0.46 --		
3T-13	4867IV	145864	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 51	-- 23	-- 26	-- SCL	-- 53	-- 35	-- 18	-- 17	-- CL	--	--	0.74 --		
3T-14	4867III	036800	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 57	-- 28	-- 15	-- SL	-- 52	-- 35	-- 22	-- 13	-- CL	--	--	1.55 --		
3T-16	4767II	956723	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 37	-- 42	-- 21	-- L	-- 75	-- 19	-- 15	-- 4	-- CL-ME	--	--	0.66 --		
3T-17	4767II	958718	Low	Bottomland flat	2	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 52	-- 35	-- 13	-- L	-- 57	-- 15	-- 13	-- 2	-- ML	--	--	0.42 --		
3T-18	4766I	879568	Low	Bottomland depression	4	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 76	-- 18	-- 6	-- LS	-- 37	-- --	-- --	-- NP	-- SH	--	--	0.51 --		
3T-19	4766III	685392	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 46	-- 34	-- 20	-- L	-- 59	-- 32	-- 16	-- 16	-- CL	--	--	0.74 --		
3T-20	4766III	670326	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 81	-- 12	-- 7	-- LS	-- 24	-- --	-- --	-- NP	-- SH	--	--	0.51 --		
3T-21	4766III	673283	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 62	-- 20	-- 18	-- SL	-- 44	-- 19	-- 12	-- 7	-- SH-SC	--	--	0.70 --		
3T-22	4867III	060732	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 67	-- 15	-- 18	-- SL	-- 38	-- 23	-- 17	-- 6	-- SH-SC	--	--	0.62 --		
3T-23	4867III	063707	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 22	-- 52	-- 26	-- SIL	-- 84	-- 40	-- 23	-- 17	-- CL	--	--	1.65 --		
3T-24	4867III	025674	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 25	-- 44	-- 31	-- CL	-- 78	-- 32	-- --	-- --	-- --	--	--	0.74 --		
3T-25	4866IV	022536	Low	Bottomland flat	1	Savanna	Grazed	0-6 6-12	-- 40	-- 36	-- 24	-- L	-- 72	-- 28	-- 17	-- 11	-- CL	--	--	0.74 --		
3T-26	4866IV	057527	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 58	-- 33	-- 9	-- SL	-- 58	-- 16	-- 15	-- 1	-- ML	--	--	0.63 --		

(Continued)

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Table A3 (Continued)

Section C. Penetration Data																					
Dry-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Moisture				Shearograph				Dry Density lb/cu ft	Moisture				Shearograph				Depth to Water Table in.
				ME, %	CI	RI	NCI	c <sub>u</sub> psi	Tan $\phi_u$	c <sub>u</sub> psi	Tan $\phi_u$		ME, %	CI	RI	NCI	c <sub>u</sub> psi	Tan $\phi_u$	c <sub>u</sub> psi	Tan $\phi_u$	
2T-30	2	0-6 6-12	-- --	12.7 14.7	475+ 544+	-- --	-- --	1.4 0.65	1.0 0.40												
2T-31	2	0-6 6-12	-- --	21.8 18.8	109 153	1.31 1.17	114 190	1.7 0.67	0.6 0.56												
2T-32	3	0-6 6-12	-- --	35.6 36.4	66 99	0.86 1.00	66 104	1.3 0.67	0.4 0.46												
2T-33	2	0-6 6-12	-- --	25.7 21.6	426 668	-- --	-- --	0.9 0.81	0.8 0.55												
2T-34	2	0-6 6-12	-- --	21.0 20.8	181 245	-- --	-- --	0.2 0.84	0.8 0.53												
2T-35	2	0-6 6-12	-- --	18.7 --	560 574+	-- --	-- --	1.3 0.55	0.6 0.35												
2T-36	2	0-6 6-12	-- --	30.8 28.0	158 146	1.16 1.21	87 167	1.0 0.73	1.8 0.28												
Chicago Mail Area																					
3T-1	2	0-6 6-12	-- --	12.0 13.5	323+ 380+	0.20 0.48	31 63	2.5 0.49	1.6 0.54												
3T-2	2	0-6 6-12	-- --	15.8 18.2	222 377+	0.40 0.66	41 75	3.0 0.56	1.4 0.51												
3T-3	2	0-6 6-12	-- --	11.1 13.3	150 154	0.31 0.51	33 36	2.7 0.54	2.0 0.48												
3T-6	2	0-6 6-12	-- --	10.3 14.6	306+ 394+	0.44 --	13 --	3.6 0.52	1.7 0.50	-- --	-- --	29 39	0.44 --	13 --	5.0 0.30	2.1 0.47		44			
3T-7	2	0-6 6-12	-- --	14.3 14.3	199 152	-- --	-- --	3.0 0.54	3.0 0.40	-- --	-- --	41 43	-- --	-- --	3.7 0.42	2.4 0.27		45			
3T-8	2	0-6 6-12	-- --	13.6 14.0	173 176	-- --	-- --	2.8 0.60	0.9 0.60												
3T-9	2	0-6 6-12	-- --	15.1 10.8	326+ 464+	0.35 0.38	45 67	4.4 0.56	1.7 0.45	-- --	-- --	129 178	0.35 0.38	45 67	4.7 0.42	1.4 0.20		44			
3T-10	2	0-6 6-12	-- --	24.9 24.0	224 230	0.50 0.62	39 60	5.0 0.36	2.0 0.42												
3T-11	2	0-6 6-12	-- --	19.1 12.2	244 366	0.64 --	96 --	3.6 0.54	1.5 0.56												
3T-12	2	0-6 6-12	-- --	21.7 12.2	172 262	0.83 --	164 --	3.6 0.40	1.6 0.42												
3T-13	2	0-6 6-12	-- --	18.9 13.5	236 424+	0.63 0.92	37 153	3.0 0.62	1.6 0.42												
3T-14	2	0-6 6-12	-- --	23.1 15.3	130 188	0.59 0.34	30 33	4.6 0.40	2.4 0.32												
3T-16	2	0-6 6-12	-- --	12.3 11.4	384+ 566+	0.47 0.46	104 182	5.0 0.52	3.1 0.46												
3T-17	2	0-6 6-12	-- --	7.1 8.0	365+ 379+	0.24 0.31	19 64	4.3 0.52	1.6 0.60												
3T-18	2	0-6 6-12	85.9 95.8	31.9 26.5	186 269	1.79 1.20	474 516	3.3 0.49	1.4 0.40	85.9 95.8	31.9 26.5	106 108	-- --	-- --	-- --	-- --		12			
3T-19	2	0-6 6-12	91.3 92.9	28.9 29.0	131 150	0.92 0.88	120 127	2.2 0.35	2.7 0.38												
3T-20	2	0-6 6-12	-- --	3.5 4.2	392+ 512+	0.46 0.53	99 146	2.2 0.70	1.4 0.40												
3T-21	2	0-6 6-12	101.7 106.4	22.7 19.8	104 130	0.46 0.61	48 80	5.0 0.30	2.2 0.29												
3T-22	2	0-6 6-12	92.4 104.9	29.2 20.4	67 142	-- --	-- --	2.5 0.46	2.0 0.46												
3T-23	2	0-6 6-12	83.8 87.7	36.3 33.4	113 182	0.74 0.88	86 161	4.6 0.62	1.3 0.44	83.8 87.7	36.3 33.4	58 112	0.69 0.88	40 99	5.6 0.51	2.0 0.47		0			
3T-24	2	0-6 6-12	90.3 97.6	32.0 22.6	66 134	0.52 0.91	40 120	4.6 0.47	2.0 0.42												
3T-25	2	0-6 6-12	-- --	11.4 11.8	434+ 462+	0.78 0.80	92 139	3.6 0.50	2.4 0.48												
3T-26	2	0-6 6-12	-- --	4.2 5.8	442+ 451+	0.19 0.23	25 35	2.5 0.49	1.5 0.40												

(Continued)

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Table A3 (Continued)

Section A. Site Data								Section B. Soil Data												
Location			Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	IRDA				By Wt. %	Atter-berg Limits				Type	Or-ganic Con-tent %	Spe-cific Grav-ity
Site No.	Map Sheet	Utd. Coordi-nates							Texture by Wt. %		Type	LL		PL	PI					
37-27	48661Y	129436	Low	Bottomland flat	2	Low scrub	Undisturbed	0-6 6-12	-- 33	-- 44	-- 23	-- L	-- 76	-- 31	-- 20	-- 11	-- CL	-- 1.49	--	
37-28	47661	973496	Low	Bottomland flat	3	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 25	-- 48	-- 27	-- L	-- 92	-- 36	-- 21	-- 15	-- CL	-- 1.20	--	
37-29	47661	966472	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 60	-- 24	-- 16	-- SL	-- 52	-- 23	-- 16	-- 7	-- CL-ML	-- 0.55	--	
37-30	47661	935475	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 24	-- 54	-- 22	-- SIL	-- 85	-- 30	-- 25	-- 13	-- ML	-- 2.23	--	
37-31	47661	959576	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	-- 60	-- 24	-- 16	-- SL	-- 48	-- 23	-- 17	-- 6	-- SM-SC	-- 1.00	--	
37-32	47661	993544	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 23	-- 41	-- 36	-- CL	-- 84	-- 37	-- 25	-- 12	-- ML	-- 1.35	--	
From Bari Area																				
47-2	49471	994501	Low	Bottomland flat	0	Tall-grass prairie	Grazed	0-6 6-12	17 --	39 --	44 --	C --	98 --	91 --	36 --	35 --	CH --	4.34 --	--	
47-4	49471	977463	Low	Bottomland flat	0	Tall-grass prairie	Grazed	0-6 6-12	13 16	62 59	25 25	SIL SIL	93 93	59 46	23 18	36 28	CH CL	1.45 0.62	--	
47-5	49471	982446	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 10	-- 56	-- 34	-- SIL	-- 96	-- 57	-- 20	-- 37	-- CH	-- 1.98	--	
47-6	49471	973451	Low	Bottomland flat	0	Tall-grass prairie	Grazed	0-6 6-12	20 20	45 45	35 35	SIL SIL	99 99	50 50	17 17	33 33	CH CH	1.15 1.15	--	
47-7	49471I	970446	Low	Bottomland flat	0	Tall-grass prairie	Grazed	0-6 6-12	-- 9	-- 49	-- 42	-- SIL	-- 97	-- 64	-- 25	-- 39	-- CH	-- 3.54	--	
47-10	49471I	984425	Low	Bottomland flat	0	Tall-grass prairie	Grazed	0-6 6-12	7 7	31 31	42 42	SIL SIL	95 95	76 76	28 28	48 48	CH CH	0.55 0.55	--	
47-11	49471	012526	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	17 32	32 35	31 33	C CL	93 74	70 60	36 24	34 36	SH CH	5.24 3.41	--	
47-12	49471	018543	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	30 41	27 31	43 28	C CL	79 64	70 47	32 19	38 28	CH CL	5.24 3.13	--	
47-20	49481I	901741	Low	Bottomland flat	0	Short-grass prairie	Cultivated (sugar cane)	0-6 6-12	8 --	69 --	23 --	SIL --	99 --	34 --	21 --	13 --	CL --	1.33 --	--	
47-21	49481I	904778	Low	Bottomland flat	0	Tall scrub savanna	Undisturbed	0-6 6-12	60 56	26 25	14 19	SL SL	48 52	15 17	14 12	1 5	SM CL-ML	0.78 0.70	--	
47-22	49481I	898791	Low	Bottomland flat	0	Tall scrub forest	Undisturbed	0-6 6-12	24 --	56 --	20 --	SIL --	83 --	34 --	23 --	11 --	CL --	3.13 --	--	
47-23	49481I	879752	Low	Bottomland flat	0	Forest	Undisturbed	0-6 6-12	58 --	29 --	13 --	SL --	55 --	14 --	14 --	0 --	ML --	0.70 --	--	
47-24	49481I	862776	Low	Bottomland flat	0	Forest	Undisturbed	0-6 6-12	58 60	29 27	13 13	SL SL	50 48	22 17	18 14	4 3	SM SM	2.75 1.33	--	
47-25	49481I	837739	Low	Natural levee	0	Forest	Undisturbed	0-6 6-12	-- 35	-- 41	-- 24	-- L	-- 77	-- 24	-- 16	-- 8	-- CL	-- 0.95	--	
47-26	49481I	845745	Low	Bottomland flat	0	Forest	Undisturbed	0-6 6-12	48 44	31 25	21 31	L OCL	60 40	26 30	14 14	12 16	CL SC	1.15 0.86	--	
47-27	49471	056578	Low	Bottomland depression	0	Barren	Undisturbed	0-6 6-12	69 39	16 20	15 41	SL C	38 66	17 45	14 15	3 30	SM CL	0.46 0.55	--	
47-28	49471	054562	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	27 17	50 51	23 32	SIL SIL	87 93	37 37	20 20	17 17	CL CL	3.62 1.98	--	
47-29	49471	986530	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	11 24	66 52	23 24	SIL SIL	99 86	34 26	22 16	12 10	CL CL	1.33 1.45	--	
47-31	49481I	929750	Low	Bottomland flat	0	Tall scrub forest	Undisturbed	0-6 6-12	63 57	24 17	13 26	SL SCL	50 50	16 22	13 10	3 12	SM SC	0.95 0.70	--	
47-32	49481I	918744	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	20 21	52 43	28 36	SIL CL	88 87	31 33	14 13	17 22	CL CL	1.25 0.55	--	
47-33	49481I	908723	Low	Bottomland flat	0	Short-grass prairie	Cultivated (sugar cane)	0-6 6-15	22 20	53 55	25 25	SIL SIL	87 91	30 32	18 19	12 13	CL CL	1.15 1.15	--	
From Kean Area																				
57-1	55601I	733172	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	30 34	58 56	12 10	SIL SIL	81 77	28 28	17 17	11 11	CL CL	0.78 0.55	2.67 2.69	
57-2	55601I	766184	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	16 14	60 52	24 34	SIL SIL	88 91	68 79	40 46	28 33	SM SM	1.15 1.05	2.70 2.78	

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Table A3 (Continued)

Section C. Trafficability Data																	
Wet-Season Condition										High-Moisture Condition							
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	ME, %	CI	RI	RCI	Sheargraph				Depth to Water Table in.
				c <sub>u</sub> psi	Tan $\phi$ u	c <sub>u</sub> psi	Tan $\phi$ ur						c <sub>u</sub> psi	Tan $\phi$ u	c <sub>u</sub> psi	Tan $\phi$ ur	
3T-27	2	0-6 6-12	-- --	15.2 14.2	112 223	0.68 0.69	101 126	2.8 2.8	0.65 0.65	1.0 1.0	0.62 0.62						
3T-28	2	0-6 6-12	-- --	12.8 11.1	430+ 454+	0.97 0.79	107 124	3.4 3.4	0.31 0.31	1.8 1.8	0.32 0.32						
3T-29	2	0-6 6-12	-- --	9.0 13.2	432+ 470+	0.45 0.63	52 120	0.8 0.8	0.66 0.66	1.5 1.5	0.48 0.48						
3T-30	2	0-6 6-12	-- --	7.4 8.2	414+ 455+	0.64 0.66	51 106	1.4 1.4	0.75 0.75	0.8 0.8	0.65 0.65						
3T-31	2	0-6 6-12	-- --	15.3 17.9	324 294	0.73 0.53	89 83	1.9 1.9	0.60 0.60	0.6 0.6	0.70 0.70						
3T-32	2	0-6 6-12	86.7 89.9	32.4 25.2	36 138	0.70 0.52	26 78	2.2 2.2	0.46 0.46	3.2 3.2	0.36 0.36						
From Buri Area																	
4T-2	1	0-6 6-12	-- --	-- --	15 27	0.77 0.66	12 18	-- --	-- --	15 27	0.77 0.66	12 18					5
4T-4	1	0-6 6-12	-- --	-- --	53 74	0.74 0.83	39 61	-- --	-- --	53 74	0.74 0.83	39 61					+2
4T-5	1	0-6 6-12	-- --	51.0 43.2	34 53	0.76 0.82	26 43	-- --	51.0 43.2	34 53	0.76 0.82	26 43					13
4T-6	1	0-6 6-12	-- --	46.7 38.6	24 58	1.12 0.80	27 46	-- --	46.7 38.6	24 58	1.12 0.80	27 46					15
4T-7	1	0-6 6-12	-- --	96.0 58.6	14 45	0.87 0.52	12 23	-- --	96.0 58.6	14 45	0.87 0.52	12 23					13
4T-10	1	0-6 6-12	-- --	-- --	16 54	0.47 0.81	8 44	-- --	-- --	16 54	0.47 0.81	8 44					5
4T-11	1	0-6 6-12	-- --	-- --	57 77	1.41 0.77	80 59										
4T-12	1	0-6 6-12	-- --	79.9 49.6	37 48	0.74 0.92	27 44	-- --	79.9 49.6	37 48	0.74 0.92	27 44					+1
4T-20	1	0-6 6-12	-- --	8.2 9.4	377 670+	-- --	-- --	2.5 2.5	0.18 0.18	0.0 0.0	0.47 0.47						
4T-21	1	0-6 6-12	-- --	2.8 4.5	393 560	-- --	-- --	0.0 0.0	0.70 0.70	1.8 1.8	0.27 0.27						
4T-22	1	0-6 6-12	-- --	6.1 5.7	750+ 750+	-- --	-- --	0.0 0.0	0.62 0.62	0.0 0.0	0.42 0.42						
4T-23	1	0-6 6-12	-- --	3.7 3.6	750+ 750+	-- --	-- --	0.4 0.4	0.40 0.40	0.0 0.0	0.58 0.58						
4T-24	1	0-6 6-12	-- --	4.4 3.6	600+ 750+	-- --	-- --	0.0 0.0	0.73 0.73	0.0 0.0	0.60 0.60						
4T-25	1	0-6 6-12	-- --	4.4 5.9	750+ 750+	-- --	-- --	1.5 1.5	0.45 0.45	2.5 2.5	0.47 0.47						
4T-26	1	0-6 6-12	-- --	6.8 5.6	750+ 750+	-- --	-- --	0.0 0.0	0.73 0.73	0.0 0.0	0.73 0.73						
4T-27	1	0-6 6-12	-- --	4.2 12.8	750+ 750+	-- --	-- --	0.5 0.5	0.97 0.97	0.0 0.0	0.81 0.81						
4T-28	1	0-6 6-12	-- --	12.2 15.0	750+ 750+	-- --	-- --	0.0 0.0	1.11 1.11	0.0 0.0	0.42 0.42						
4T-29	1	0-6 6-12	-- --	29.5 28.7	62 113	0.67 0.69	42 78	-- --	29.5 28.7	62 113	0.67 0.69	42 78					+4
4T-31	1	0-6 6-12	-- --	1.3 5.4	750+ 750+	-- --	-- --	1.5 1.5	0.84 0.84	1.7 1.7	0.34 0.34						
4T-32	1	0-6 6-12	-- --	6.5 12.6	750+ 750+	-- --	-- --	0.0 0.0	0.97 0.97	0.0 0.0	0.75 0.75						
4T-33	1	0-6 6-12	-- --	6.0 10.8	151 328	-- --	-- --	0.0 0.0	0.58 0.58	0.0 0.0	0.84 0.84						
Khon Kasn Area																	
5T-1	2	0-6 6-12	95.1 100.2	19.7 20.8	142 198	0.67 0.80	102 172	3.0 3.0	0.54 0.54	0.4 0.4	0.58 0.58	-- --	21.8 23.6	91 104	0.55 0.66	50 69	18
5T-2	2	0-6 6-12	-- --	27.0 28.6	252 418	1.37 1.19	292 224	1.0 1.0	0.57 0.57	1.0 1.0	0.32 0.32						

(Continued)

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Table A3 (Continued)

Section A. Site Data										Section B. Soil Data												
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Type	Or- ganic Con- tent %	Spe- cific Grav- ity			
Site No.	Map Sheet	Grid Coor- di- nates							Texture by Wt. %				Atter- berg Limits									
									Sand	Silt	Clay	Type	Fines %	LL	PL	PI						
5T-3	5560II	805180	Low	Bottomland flat	0	Barren	Cultivated (rice)	0-6 6-12	10 77	60 17	30 6	S1CL LS	94 30	60 --	29 --	31 NP	CH SH	1.05 0.36	2.71 2.65			
5T-4	5560II	806220	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	84 77	11 17	5 6	LS LS	22 30	-- --	-- --	NP NP	SM SM	0.55 0.25	2.65 2.65			
5T-5	5560II	810245	Low	Bottomland flat	0	Short-grass prairie	Cultivated (jute)	0-6 6-12	69 65	25 31	6 4	SL SL	37 42	-- --	-- --	NP NP	SM SM	0.95 0.38	2.63 2.65			
5T-6	5560I	827257	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	76 83	22 17	2 0	LS LS	30 23	-- --	-- --	NP NP	SM SM	1.98 0.32	2.63 2.63			
5T-7	5560I	850277	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	72 67	27 31	1 2	LS GSL	35 30	17 26	13 13	4 SC	SM-SC SC	0.70 0.55	2.64 2.77			
5T-8	5560II	735148	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	31 27	60 60	9 13	S1L S1L	77 81	22 25	-- 18	-- 7	ML CL-ML	0.62 0.46	2.61 2.71			
5T-9	5660III	907186	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	77 75	20 21	3 4	LS LS	33 35	-- --	-- --	NP NP	SM SM	0.78 0.25	2.65 2.66			
5T-10	5660III	933176	High	Upland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	82 79	16 18	2 3	LS LS	27 31	-- --	-- --	NP NP	SM SM	0.70 0.38	2.65 2.67			
5T-11	5560II	718218	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	63 68	30 27	7 5	SL SL	46 39	-- --	-- --	NP NP	SM SM	0.55 0.25	2.67 2.69			
5T-12	5560II	730246	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	40 39	54 53	6 8	S1L S1L	69 70	28 33	18 22	10 11	CL CL	1.05 0.38	2.60 2.60			
5T-13	5560II	610155	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	44 40	46 46	10 14	L L	65 67	35 38	22 21	13 17	CL CL	0.78 0.95	2.71 2.76			
5T-14	5560II	660152	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	48 42	42 46	10 12	L L	63 68	24 31	-- 17	-- 14	ML CL	0.62 0.46	2.62 2.64			
5T-15	5461II	160453	Low	Upland depression	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	72 76	24 24	4 0	SL LS	39 33	-- --	-- --	NP NP	SM SM	0.62 0.38	2.65 2.64			
5T-16	5461II	125460	Low	Upland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	59 54	46 39	5 7	SL SL	54 58	-- --	-- --	NP NP	ML ML	0.32 0.46	2.62 2.65			
5T-17	5560II	665092	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	74 67	19 23	7 10	SL SL	33 41	-- 25	-- 17	NP 8	SM SC	0.38 0.38	2.64 2.65			
5T-18	5560II	667244	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	76 72	21 24	3 4	LS SL	40 46	-- --	-- --	NP NP	SM SH	1.25 0.55	2.65 2.67			
5T-19	5460I	237277	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	9 10	61 65	30 25	S1CL S1L	94 93	72 73	36 28	36 45	MH CH	0.70 0.46	2.68 2.78			
5T-20	5460I	236287	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	59 59	37 34	4 7	SL SL	48 48	22 30	18 14	4 16	SM-SC SC	0.70 0.55	2.67 2.69			
5T-21	5460I	234344	High	Upland depression	0	Short-grass prairie	Logged	0-6 6-12	73 65	23 28	4 7	SL SL	38 44	-- 24	-- 18	NP 6	SM SM-SC	0.86 0.46	2.68 2.63			
5T-22	5460I	283324	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	41 44	52 47	7 9	S1L L	69 65	23 29	-- 14	NP 15	ML CL	0.95 0.78	2.61 2.60			
5T-23	5460I	163395	High	Upland flat	0	Woodland	Logged	0-6 6-12	82 82	15 16	3 2	LS LS	26 26	-- --	-- --	NP NP	SM SH	0.62 0.25	2.61 2.63			
5T-24	5460I	143363	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	62 74	34 26	4 0	SL LS	49 34	-- --	-- --	NP NP	SM SM	0.62 0.38	2.59 2.64			
5T-25	5460II	188253	Low	Bottomland flat	0	Barren	Cultivated (rice)	0-6 6-12	30 24	59 65	11 11	S1L S1L	81 87	50 41	20 29	30 12	CL ML	0.86 0.70	2.67 2.66			
5T-26	5460II	293240	Low	Upland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	65 59	34 40	1 1	SL SL	47 52	-- 20	-- 16	NP 4	SM CL-ML	0.32 0.32	2.62 2.66			
5T-27	5461III	990485	Low	Upland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	51 63	43 33	6 4	SL SL	58 48	22 19	-- --	NP NP	ML SM	0.55 0.38	2.72 2.72			
5T-28	5460II	266190	Low	Bottomland depression	0	Low scrub	Cultivated (rice)	0-6 6-12	52 45	42 47	6 8	SL L	60 67	24 26	17 15	7 11	CL-ML CL	0.38 0.32	2.65 2.65			
5T-29	5560III	455215	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	67 57	30 39	3 4	SL SL	48 60	-- --	-- --	NP NP	SM ML	0.38 0.18	2.67 2.67			
5T-30	5560III	375225	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	54 54	44 41	2 5	SL SL	60 58	-- 18	-- --	NP NP	ML ML	0.70 0.38	2.64 2.65			
5T-31	5560III	377173	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	20 14	67 62	13 24	S1L S1L	89 91	22 27	19 18	3 9	ML CL	0.55 0.38	2.64 2.64			
5T-32	5560III	504145	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	72 74	25 21	3 5	SL SL	37 38	-- --	-- --	NP NP	SM SM	0.70 0.38	2.63 2.66			
5T-33	5560III	563137	High	Upland flat	0	Low scrub	Cultivated (jute)	0-6 6-12	77 79	19 18	4 3	LS LS	32 30	-- --	-- --	NP NP	SM SM	0.55 0.38	2.65 2.61			

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Table A3 (Continued)

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Table A3 (Continued)

Section A. Site Data								Section B. Soil Data											
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Or- ganic Con- tent %	Spe- cific Grav- ity	
Site No.	Map Sheet	Grid Coordi- nates							Texture by Wt. %				By Wt %	Atter- berg Limits					
									Sand	Silt	Clay	Type		LL	PL	PI			Type
ST-34	5560III	515237	Low	Bottomland flat	0	Barren	Cultivated (rice)	0-6 6-12	56 58	41 54	3 8	SL CL	52 52	-- 17	-- 13	-- 8	NP ML	0.32 0.32	2.60 2.63
ST-35	5560III	560207	High	Upland flat	0	Short-grass prairie	Cultivated (jute)	0-6 6-12	76 75	21 22	3 3	LS LS	33 34	-- --	-- --	-- --	NP SM	1.05 0.86	2.62 2.65
ST-40	5560II	797160	Low	Bottomland flat	0	Low scrub	Logged	0-6 6-12	-- 7	-- 28	-- 65	-- C	-- 96	-- 86	-- 30	-- 56	-- CH	4.70 2.87	-- --
ST-41	5560II	792158	Low	Bottomland depression	0	Low scrub	Logged	0-6 6-12	-- 5	-- 35	-- 60	-- C	-- 97	-- 80	-- 28	-- 52	-- CH	3.96 1.98	-- --
ST-42	5560II	794157	Low	Bottomland flat	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 6	-- 23	-- 71	-- C	-- 97	-- 100	-- 31	-- 69	-- CH	2.23 1.98	-- --
ST-43	5560II	794153	Low	Bottomland flat	0	Low scrub	Undisturbed	0-6 6-12	-- 6	-- 28	-- 66	-- C	-- 98	-- 79	-- 27	-- 52	-- CH	5.74 3.96	-- --
ST-44	5560II	794153	Low	Bottomland depression	0	Low scrub	Logged	0-6 6-12	-- 7	-- 29	-- 64	-- C	-- 97	-- 93	-- 38	-- 55	-- CH	5.50 2.75	-- --
ST-45	5560II	794153	Low	Bottomland depression	0	Low scrub	Logged	0-6 6-12	-- 5	-- 27	-- 68	-- C	-- 99	-- 93	-- 35	-- 58	-- CH	7.24 3.41	-- --
ST-46	5560II	727240	Low	Bottomland flat	0	Short grass prairie	Cultivated (rice)	0-6 6-12	-- 58	-- 26	-- 16	-- SL	-- 53	-- 21	-- 12	-- 9	-- CL	1.25 0.70	-- --
ST-47	5560II	727237	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 33	-- 38	-- 29	-- CL	-- 76	-- 32	-- 13	-- 19	-- CL	1.45 0.95	-- --
ST-48	5560II	727240	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 35	-- 41	-- 24	-- L	-- 76	-- 29	-- 13	-- 16	-- CL	0.78 0.70	-- --
ST-49	5560II	732237	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 35	-- 27	-- 38	-- CL	-- 74	-- 40	-- 14	-- 26	-- CL	1.25 0.86	-- --
ST-50	5560II	760201	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 27	-- 53	-- 20	-- SIL	-- 89	-- 28	-- 18	-- 10	-- CL	1.15 0.78	-- --
Chanthaburi Area																			
6T-1	5349III	486103	Low	Bottomland flat	0	Woodland	Rubber plantation	0-6 6-12	-- 52	-- 30	-- 18	-- GL	-- 29	-- 48	-- 30	-- 18	-- SM	-- --	-- 3.14
6T-2	5349II	120070	High	Terrace slope	2	Tall-grass prairie	Undisturbed	0-6 6-12	-- 52	-- 30	-- 18	-- VGL	-- 23	-- 43	-- 21	-- 22	-- SC	-- --	-- 3.19
6T-3	5448IV	849000	High	Upper flat	2	Short-grass prairie	Rambutan orchard	0-6 6-12	-- 33	-- 48	-- 19	-- L	-- 75	-- 31	-- 19	-- 12	-- CL	-- 0.78	-- 2.69
6T-4	5349II	120093	Low	Bottomland depression	0	Tall-grass prairie	Undisturbed	0-6 6-12	-- 16	-- 54	-- 30	-- SIL	-- 87	-- 30	-- 18	-- 12	-- CL	-- 0.70	-- 2.61
6T-5	5349II	133032	High	Terrace slope	2	Tall scrub woodland	Logged	0-6 6-12	-- 64	-- 33	-- 3	-- SL	-- 49	-- --	-- --	-- NP	-- SM	0.46 2.64	-- --
6T-6	5449IV	969083	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 58	-- 26	-- 16	-- SL	-- 45	-- 25	-- 15	-- 10	-- SC	-- 0.55	-- 2.65
6T-7	5349II	073103	Low	Bottomland depression	0	Short-grass prairie	Grassed	0-6 6-12	-- 10	-- 64	-- 26	-- SIL	-- 88	-- 30	-- 20	-- 10	-- CL	-- 0.62	-- 2.66
6T-8	5448IV	862788	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 69	-- 21	-- 10	-- SL	-- 40	-- 28	-- --	-- NP	-- SM	0.38 2.68	-- --
6T-9	5349II	207077	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 6	-- 52	-- 42	-- SIL	-- 95	-- 47	-- 30	-- 17	-- ML	-- 1.05	-- 2.71
6T-10	5448IV	883910	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 84	-- 8	-- 8	-- LS	-- 18	-- 21	-- 14	-- 7	-- SM-SC	-- --	-- 2.65
6T-11	5348I	145970	Low	Bottomland flat	0	Woodland	Coconut orchard	0-6 6-12	-- 80	-- 14	-- 6	-- LS	-- 26	-- --	-- --	-- NP	-- SM	0.70 2.65	-- --
6T-12	5448IV	915836	Low	Bottomland flat	0	Savanna	Rambutan orchard	0-6 6-12	-- 86	-- 8	-- 6	-- LS	-- 17	-- 17	-- --	-- NP	-- SM	-- --	-- 2.62
6T-13	5448IV	873881	Low	Bottomland flat	0	Savanna	Cultivated (sugar cane)	0-6 6-12	-- 79	-- 17	-- 4	-- LS	-- 27	-- --	-- --	-- NP	-- SM	-- --	-- 2.67
6T-14	5448III	893811	Low	Bottomland flat	0	Low scrub	Nipa palm orchard	0-6 6-12	-- 14	-- 52	-- 34	-- SIL	-- 91	-- 77	-- 33	-- 44	-- CH	4.15 2.60	-- --
6T-15	5448III	889791	Low	Bottomland flat	0	Savanna	Cultivated (idle)	0-6 6-12	-- 18	-- 44	-- 38	-- SIL	-- 85	-- 60	-- 36	-- 24	-- MH	-- 5.02	-- 2.61
6T-16	5448IV	846936	Low	Bottomland flat	0	Savanna	Cultivated (idle)	0-6 6-12	-- 13	-- 55	-- 32	-- SIL	-- 93	-- 32	-- 21	-- 11	-- CL	-- 1.65	-- 2.67
6T-17	5348I	225970	Low	Bottomland flat	0	Low scrub	Logged	0-6 6-12	-- 19	-- 58	-- 23	-- SIL	-- 88	-- 37	-- 20	-- 17	-- CL	-- 2.47	-- 2.61

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Table A3 (Continued)

Section C. Trafficability Data																						
Wet-Season Condition													High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %				Sheargraph				Dry Density lb/cu ft	MC, %				Sheargraph				Depth to Water Table in.	
				CI	RI	RCI	c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi	Tan $\phi_{ur}$	CI		RI	RCI	c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi	Tan $\phi_{ur}$				
5T-34	2	0-6 6-12	-- --	11.6 13.0	310 434+	0.62 --	87 --	2.2	0.59	1.2	0.40											
5T-35	2	0-6 6-12	-- --	3.1 7.0	604+ 750+	-- --	-- --	1.6	0.58	0.3	0.40											
5T-40	2	0-6 6-12	72.8 72.8	19.8 22.3	329 492+	1.67 1.08	449 420	0.6	0.91	0.0	0.61											
5T-41	2	0-6 6-12	-- --	21.8 25.3	268 521+	-- --	-- --	0.6	1.04	0.7	0.51											
5T-42	2	0-6 6-12	68.5 74.9	62.0 42.2	106 173	1.78 1.45	175 149	0.8	0.72	0.0	0.48											
5T-43	2	0-6 6-12	62.8 80.2	56.4 40.4	158 242	0.80 0.90	23 93	1.4	0.69	1.0	0.34											
5T-44	2	0-6 6-12	59.9 64.4	30.9 31.2	260 392+	2.80 1.24	672 487	0.6	0.85	0.0	0.56											
5T-45	1	0-6 6-12	65.2 70.5	29.6 35.0	269 365	1.25 1.59	336 580	0.9	0.87	0.2	0.60											
5T-46	2	0-6 6-12	-- --	11.4 11.4	366 488+	1.05 --	359 --	0.9	0.86	0.6	0.49											
5T-47	2	0-6 6-12	-- --	14.8 14.0	344+ 488+	-- --	-- --	1.2	0.70	0.1	0.58											
5T-48	2	0-6 6-12	-- --	9.8 14.3	616+ 750+	-- --	-- --	1.3	0.76	0.7	0.64											
5T-49	2	0-6 6-12	-- --	11.0 12.5	588+ 750+	-- --	-- --	2.2	0.69	0.8	0.60											
5T-50	2	0-6 6-12	-- --	11.4 12.3	547+ 750+	-- --	-- --	1.4	0.97	0.4	0.52											
Chanthaburi Area																						
6T-1	1	0-6 6-12	-- --	-- --	205 525+	-- --	-- --	2.3	0.73	1.6	0.47											
6T-2	1	0-6 6-12	-- --	-- --	241 351+	-- --	-- --	0.0	0.93	0.6	0.53											
6T-3	1	0-6 6-12	-- --	23.0 22.0	70 103	0.44 1.10	31 113	--	--	--	--											
6T-4	1	0-6 6-12	-- --	22.2 21.5	54 76	0.25 0.53	13 41	0.8	0.67	1.4	0.27	-- --	22.2 21.5	54 76	0.25 0.53	13 41	--	--	--	--	6	
6T-5	1	0-6 6-12	-- --	17.4 14.5	212 269	0.64 0.55	136 148	1.0	0.49	0.6	0.47											
6T-6	1	0-6 6-12	-- --	28.5 16.2	140 192	0.80 0.80	112 155	-- --	-- --	-- --	-- --	-- --	28.5 16.2	140 192	0.80 0.80	112 155	--	--	--	--	+1	
6T-7	1	0-6 6-12	-- --	23.1 28.6	111 109	0.62 0.67	69 73	2.1	0.70	0.0	0.53											
6T-8	1	0-6 6-12	-- --	21.3 24.4	117 307	1.26 1.16	147 357	0.8	0.47	0.7	0.42	-- --	21.3 24.4	117 307	1.26 1.16	147 357	--	--	--	--	12	
6T-9	1	0-6 6-12	-- --	-- --	40 128	0.55 0.60	22 77	2.6	0.42	0.4	0.45	-- --	-- --	40 128	0.55 0.60	22 77	2.6	0.42	0.4	0.45	0	
6T-10	1	0-6 6-12	-- --	20.5 12.6	240 633+	-- --	-- --	--	--	--	--	-- --	20.5 12.6	240 633+	-- --	-- --	--	--	--	--	+3	
6T-11	1	0-6 6-12	-- --	14.2 13.6	159 168	-- --	-- --	1.4	0.60	0.4	0.34											
6T-12	1	0-6 6-12	-- --	12.3 12.1	65 105	2.25 2.02	145 212	1.2	0.45	0.0	0.47											
6T-13	1	0-6 6-12	-- --	19.2 15.5	80 215	-- --	-- --	1.0	0.45	0.0	0.55											
6T-14	1	0-6 6-12	-- --	70.9 77.4	14 30	1.58 1.44	22 43	--	--	--	--	-- --	70.9 77.4	14 30	1.58 1.44	22 43	--	--	--	--	3	
6T-15	1	0-6 6-12	-- --	45.6 48.1	29 55	0.78 0.77	23 42	--	--	--	--	-- --	45.6 48.1	29 55	0.78 0.77	23 42	--	--	--	--	+4	
6T-16	1	0-6 6-12	-- --	24.1 40.7	49 33	0.93 0.48	45 16	--	--	--	--	-- --	24.1 40.7	49 33	0.93 0.48	45 16	--	--	--	--	+12	
6T-17	1	0-6 6-12	-- --	16.0 24.1	127 124	0.85 0.82	108 102	1.8	0.58	1.3	0.36											

(Continued)

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Table A3 (Continued)

Section A. Site Data									Section B. Soil Data											
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Or- ganic Con- tent %	Spe- cific Grav- ity		
Site No.	Map Sheet	Grid Coor- di- nates							Texture by Wt. %				By Wt %	Atter- berg Limits						
									Sand	Silt	Clay	Type		LL	PL	PI			Type	
6T-18	5448IV	800847	Low	Bottomland flat	0	Barren	Undisturbed	0-6 6-12	-- 56	-- 31	-- 13	-- SL	-- 53	-- 43	-- 24	-- 19	-- CL	-- 2.87	-- 2.65	
6T-19	5348I	210950	Low	Tidal flat	0	Low scrub	Logged	0-6 6-12	-- 40	-- 53	-- 7	-- SiL	-- 73	-- 71	-- 49	-- 22	-- MH	-- --	-- 2.64	
6T-20	5348I	171936	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 50	-- 24	-- 26	-- SCL	-- 56	-- 27	-- 15	-- 12	-- CL	-- 0.86	-- 2.63	
6T-21	5348I	277879	Low	Beach	1	Woodland	Coconut orchard	0-6 6-12	-- 99	-- 1	-- 0	-- S	-- 6	-- --	-- --	-- NP	-- SP-SM	-- --	-- 2.72	
6T-22	5448III	901826	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 30	-- 47	-- 23	-- L	-- 74	-- 39	-- 18	-- 21	-- CL	-- --	-- 2.62	
6T-23	5448III	820809	Low	Bottomland flat	0	Savanna	Cultivated (idle)	0-6 6-12	-- 21	-- 45	-- 34	-- CL	-- 84	-- 75	-- 38	-- 37	-- MH	-- 4.05	-- 2.65	
6T-24	5348I	195976	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 45	-- 27	-- 28	-- CL	-- 60	-- 34	-- 19	-- 15	-- CL	-- 0.78	-- 2.66	
6T-25	5448IV	810923	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 15	-- 52	-- 33	-- SiCL	-- 90	-- 50	-- 26	-- 24	-- CH	-- 0.70	-- 2.66	
6T-26	5448IV	976006	High	Upper slope	4	Savanna	Rubber plantation	0-6 6-12	-- 76	-- 15	-- 9	-- GSL	-- 15	-- 27	-- 19	-- 8	-- SC	-- --	-- 2.77	
6T-27	5349II	220081	Low	Bottomland flat	0	Short-grass prairie	Orange orchard	0-6 6-12	-- 65	-- 22	-- 13	-- SL	-- 40	-- 22	-- 14	-- 8	-- SC	-- 0.62	-- 2.63	
6T-28	5448IV	896980	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 14	-- 59	-- 27	-- SiL	-- 90	-- 49	-- 34	-- 15	-- ML	-- 1.33	-- 2.61	
6T-29	5448IV	940017	Low	Bottomland flat	0	Low scrub; short- grass prairie	Cultivated (idle)	0-6 6-12	-- 34	-- 34	-- 32	-- CL	-- 71	-- 58	-- 32	-- 26	-- MH	-- 0.78	-- 2.67	
6T-30	5449III	978060	Low	Bottomland flat	0	Low scrub; short- grass prairie	Cultivated (idle)	0-6 6-12	-- 22	-- 40	-- 38	-- CL	-- 75	-- 53	-- 33	-- 20	-- MH	-- 0.78	-- 2.70	
6T-31	5449III	993072	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 57	-- 29	-- 14	-- SL	-- 52	-- 27	-- 15	-- 12	-- CL	-- 0.38	-- 2.61	
6T-32	5449III	924035	Low	Bottomland flat	0	Savanna	Rambutan orchard	0-6 6-12	-- 22	-- 47	-- 31	-- CL	-- 83	-- 54	-- 34	-- 20	-- MH	-- 1.33	-- 2.65	
6T-33	5449III	932074	Low	Bottomland depression	0	Woodland	Rubber plantation	0-6 6-12	-- 50	-- 30	-- 20	-- L	-- 55	-- 32	-- 20	-- 12	-- CL	-- 0.86	-- 2.62	
6T-34	5348I	217015	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6 6-12	-- 15	-- 56	-- 29	-- SiCL	-- 89	-- 55	-- 36	-- 19	-- MH	-- 2.35	-- 2.63	
6T-35	5448IV	775959	Low	Bottomland flat	0	Savanna	Rambutan orchard	0-6 6-12	-- 59	-- 29	-- 12	-- SL	-- 48	-- 58	-- 45	-- 13	-- SM	-- 2.87	-- 2.81	
6T-36	5349II	103019	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 87	-- 11	-- 2	-- S	-- 22	-- --	-- --	-- NP	-- SM	-- 0.38	-- 2.63	
6T-37	5449III	784024	Low	Terrace flat	0	Low scrub	Rubber plantation	0-6 6-12	-- 65	-- 20	-- 15	-- GSL	-- 32	-- 39	-- 23	-- 16	-- SC	-- --	-- 2.61	
6T-38	5448IV	825014	Low	Upland flat	0	Short-grass prairie	Rubber plantation	0-6 6-12	-- 59	-- 21	-- 20	-- SL	-- 40	-- 42	-- 26	-- 16	-- SM	-- 1.65	-- 2.58	
6T-39	5448IV	914864	Low	Terrace flat	0	Savanna	Durian orchard	0-6 6-12	-- 43	-- 36	-- 21	-- L	-- 60	-- 54	-- 34	-- 20	-- MH	-- 1.55	-- 2.62	
6T-40	5449III	821079	High	Upland flat	0	Low scrub	Cultivated (idle)	0-6 6-12	-- 59	-- 28	-- 13	-- SL	-- 50	-- 41	-- 29	-- 12	-- SM	-- 1.55	-- 2.65	
6T-41	5449III	806024	High	Upland flat	0	Savanna	Orange orchard	0-6 6-12	-- 60	-- 22	-- 18	-- SL	-- 44	-- 38	-- 19	-- 19	-- SC	-- 0.70	-- 2.62	
6T-42	5448III	009814	Low	Terrace flat	0	Savanna	Rubber plantation	0-6 6-12	-- 63	-- 24	-- 13	-- SL	-- 36	-- 45	-- 30	-- 15	-- SM	-- 1.33	-- 2.61	
6T-43	5448III	960793	Low	Bottomland flat	0	Savanna	Rubber plantation	0-6 6-12	-- 77	-- 14	-- 9	-- SL	-- 26	-- --	-- --	-- NP	-- SM	-- 1.45	-- 2.60	
6T-44	5449III	890050	High	Upland flat	0	Tall scrub woodland	Logged	0-6 6-12	-- 45	-- 37	-- 18	-- L	-- 61	-- 44	-- 31	-- 13	-- ML	-- 1.65	-- 2.60	
6T-45	5448IV	804004	High	Upper slope	15	Savanna	Rubber plantation	0-6 6-12	-- 59	-- 17	-- 24	-- GSCL	-- 28	-- 53	-- 29	-- 24	-- SM	-- --	-- 2.64	
6T-46	5448IV	774983	Low	Bottomland flat	0	Savanna	Rubber plantation	0-6 6-12	-- 49	-- 37	-- 14	-- L	-- 61	-- 59	-- 43	-- 16	-- MH	-- 1.98	-- 2.73	
6T-47	5448IV	790947	Low	Bottomland flat	0	Short-grass prairie	Durian orchard	0-6 6-12	-- 56	-- 36	-- 8	-- SL	-- 55	-- 57	-- 45	-- 12	-- MH	-- 2.08	-- 2.65	
6T-48	5448IV	846985	Low	Bottomland flat	0	Savanna	Rubber plantation	0-6 6-12	-- 31	-- 55	-- 14	-- SiL	-- 78	-- 39	-- 26	-- 13	-- ML	-- 1.88	-- 2.65	

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Table A3 (Continued)

Section C. Trafficability Data																				
Wet-Season Condition										High-Moisture Condition										
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Depth to Water Table in.							
				MC, %	CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi	Tan $\phi_{ur}$		c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi	Tan $\phi_{ur}$			
6T-18	1	0-6	--	45.5	13	0.97	13	--	--	--	--	45.5	13	0.97	13	--	--	--	--	6
		6-12	--	54.6	22	0.98	21	--	--	--	--	54.6	22	0.98	21	--	--	--	--	
6T-19	1	0-6	--	--	36	0.69	25	--	--	--	--	--	36	0.69	25	--	--	--	--	3
		6-12	--	--	54	0.97	52	--	--	--	--	--	54	0.97	52	--	--	--	--	
6T-20	1	0-6	--	18.9	187	0.65	122	1.0	0.62	0.2	0.36	--	18.9	187	0.65	122	--	--	--	12
		6-12	--	20.6	131	0.70	92	--	--	--	--	--	20.6	131	0.70	92	--	--	--	
6T-21	1	0-6	--	23.0	132	--	--	--	--	--	--	--	23.0	132	--	--	--	--	--	
		6-12	--	21.6	212	--	--	--	--	--	--	--	21.6	212	--	--	--	--	--	
6T-22	1	0-6	--	18.3	55	0.80	44	--	--	--	--	--	18.3	55	0.80	44	--	--	--	+3
		6-12	--	33.3	87	0.58	50	--	--	--	--	--	33.3	87	0.58	50	--	--	--	
6T-23	1	0-6	--	59.0	30	0.85	25	--	--	--	--	--	59.0	30	0.85	25	--	--	--	+13
		6-12	--	75.3	46	0.81	37	--	--	--	--	--	75.3	46	0.81	37	--	--	--	
6T-24	1	0-6	--	31.6	94	0.65	61	2.0	0.36	1.3	0.34	--	31.6	94	0.65	61	--	--	--	6
		6-12	--	23.7	130	0.80	104	--	--	--	--	--	23.7	130	0.80	104	--	--	--	
6T-25	1	0-6	--	30.5	78	1.29	101	--	--	--	--	--	30.5	78	1.29	101	--	--	--	+7
		6-12	--	30.8	128	0.59	75	--	--	--	--	--	30.8	128	0.59	75	--	--	--	
6T-26	1	0-6	--	15.2	205	--	--	1.0	0.58	0.8	0.42	--	15.2	205	--	--	--	--	--	
		6-12	--	12.3	633+	--	--	--	--	--	--	--	12.3	633+	--	--	--	--	--	
6T-27	1	0-6	--	14.3	154	1.29	199	1.2	0.62	0.9	0.51	--	14.3	154	1.29	199	--	--	--	
		6-12	--	14.0	192	0.78	150	--	--	--	--	--	14.0	192	0.78	150	--	--	--	
6T-28	1	0-6	--	39.2	144	0.77	111	0.8	0.60	1.1	0.51	--	39.2	144	0.77	111	--	--	--	12
		6-12	--	37.7	281	0.52	146	--	--	--	--	--	37.7	281	0.52	146	--	--	--	
6T-29	1	0-6	--	21.9	135	0.64	86	--	--	--	--	--	21.9	135	0.64	86	--	--	--	+3
		6-12	--	33.4	183	0.43	79	--	--	--	--	--	33.4	183	0.43	79	--	--	--	
6T-30	1	0-6	--	33.3	102	0.66	67	--	--	--	--	--	33.3	102	0.66	67	--	--	--	+5
		6-12	--	30.2	172	0.73	125	--	--	--	--	--	30.2	172	0.73	125	--	--	--	
6T-31	1	0-6	--	17.5	155	--	--	--	--	--	--	--	17.5	155	--	--	--	--	--	+11
		6-12	--	15.2	185	--	--	--	--	--	--	--	15.2	185	--	--	--	--	--	
6T-32	1	0-6	--	36.7	87	0.60	52	--	--	--	--	--	36.7	87	0.60	52	--	--	--	
		6-12	--	30.6	132	0.70	92	--	--	--	--	--	30.6	132	0.70	92	--	--	--	
6T-33	1	0-6	--	24.7	112	0.82	92	2.8	0.60	1.9	0.45	--	24.7	112	0.82	92	--	--	--	
		6-12	--	21.5	127	0.71	90	--	--	--	--	--	21.5	127	0.71	90	--	--	--	
6T-34	1	0-6	--	34.7	132	0.60	79	2.4	0.49	1.2	0.47	--	34.7	132	0.60	79	--	--	--	
		6-12	--	45.5	90	0.40	36	--	--	--	--	--	45.5	90	0.40	36	--	--	--	
6T-35	1	0-6	--	48.2	41	0.33	13	1.2	0.73	1.7	0.42	--	48.2	41	0.33	13	--	--	--	
		6-12	--	44.8	60	0.49	29	--	--	--	--	--	44.8	60	0.49	29	--	--	--	
6T-36	1	0-6	--	20.2	252	1.70	428	--	--	--	--	--	20.2	252	1.70	428	--	--	--	9
		6-12	--	19.4	442	1.91	844	--	--	--	--	--	19.4	442	1.91	844	--	--	--	
6T-37	1	0-6	--	13.1	275	1.10	248	2.2	0.51	0.5	0.49	--	13.1	275	1.10	248	--	--	--	
		6-12	--	14.1	325	1.15	359	--	--	--	--	--	14.1	325	1.15	359	--	--	--	
6T-38	1	0-6	--	17.5	99	1.25	124	1.7	0.40	0.5	0.51	--	17.5	99	1.25	124	--	--	--	
		6-12	--	20.7	237	1.45	344	--	--	--	--	--	20.7	237	1.45	344	--	--	--	
6T-39	1	0-6	--	30.0	175	0.77	135	0.5	0.49	0.3	0.45	--	30.0	175	0.77	135	--	--	--	
		6-12	--	29.0	187	0.97	182	--	--	--	--	--	29.0	187	0.97	182	--	--	--	
6T-40	1	0-6	--	29.3	109	0.37	40	2.2	0.62	1.2	0.58	--	29.3	109	0.37	40	--	--	--	
		6-12	--	28.6	146	0.48	70	--	--	--	--	--	28.6	146	0.48	70	--	--	--	
6T-41	1	0-6	--	17.2	107	1.35	144	2.0	0.60	1.0	0.55	--	17.2	107	1.35	144	--	--	--	
		6-12	--	16.9	180	0.83	149	--	--	--	--	--	16.9	180	0.83	149	--	--	--	
6T-42	1	0-6	--	23.3	170	--	--	0.8	0.42	0.2	0.36	--	23.3	170	--	--	--	--	--	
		6-12	--	22.4	267	--	--	--	--	--	--	--	22.4	267	--	--	--	--	--	
6T-43	1	0-6	--	11.0	175	--	--	0.5	0.51	0.2	0.55	--	11.0	175	--	--	--	--	--	
		6-12	--	11.1	212	--	--	--	--	--	--	--	11.1	212	--	--	--	--	--	
6T-44	1	0-6	--	30.0	144	0.72	104	2.0	0.42	1.0	0.49	--	30.0	144	0.72	104	--	--	--	
		6-12	--	32.6	128	0.66	84	--	--	--	--	--	32.6	128	0.66	84	--	--	--	
6T-45	1	0-6	--	--	458	--	--	1.0	0.40	1.0	0.36	--	--	458	--	--	--	--	--	
		6-12	--	--	750+	--	--	--	--	--	--	--	--	750+	--	--	--	--	--	
6T-46	1	0-6	--	40.9	53	1.53	81	1.2	0.55	1.5	0.49	--	40.9	53	1.53	81	--	--	--	
		6-12	--	40.0	78	1.66	130	--	--	--	--	--	40.0	78	1.66	130	--	--	--	
6T-47	1	0-6	--	47.3	69	0.38	26	0.6	0.60	0.8	0.58	--	47.3	69	0.38	26	--	--	--	
		6-12	--	46.5	70	0.89	62	--	--	--	--	--	46.5	70	0.89	62	--	--	--	
6T-48	1	0-6	--	--	94	--	--	1.4	0.45	0.0	0.36	--	--	94	--	--	--	--	--	
		6-12	--	--	107	--	--	--	--	--	--	--	--	107	--	--	--	--	--	

(Continued)

(24 of 16 sheets)

Table A3 (Continued)

Section A. Site Data									Section B. Soil Data										
Location			Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Or-ganic Con-tent %	Spe-cific Grav-ity	
Site No.	Map Sheet	Grid Coor-di-nates							Texture by Wt. %			By Wt %	Atter-berg Limits						
									Sand	Silt	Clay		Type	LL	PL	PI			Type
6T-49	5448IV	995964	Low	Bottomland flat	0	Savanna	Rambutan orchard	0-6 6-12	-- 36	-- 7	-- 7	-- LS	-- 16	-- 18	-- --	-- NP	-- SM	-- 1.05	-- 2.63
6T-50	5448IV	820970	Low	Bottomland flat	0	Savanna	Rubber plantation	0-6 6-12	-- 60	-- 21	-- 19	-- SL	-- 44	-- 38	-- 24	-- 14	-- SC	-- 0.95	-- 2.61
6T-51	5448IV	877880	Low	Lower slope	25	Savanna	Rubber plantation	0-6 6-12	-- 79	-- 16	-- 5	-- GLS	-- 14	-- 15	-- --	-- NP	-- SM	-- --	-- 2.57
6T-52	5349II	145098	Low	Terrace flat	0	Short-grass prairie	Rubber plantation	0-6 6-12	-- 57	-- 29	-- 14	-- SL	-- 53	-- 25	-- 20	-- 5	-- CL-ML	-- 1.55	-- 2.61
6T-53	5448IV	933858	Low	Upland flat	0	Low scrub	Rubber plantation	0-6 6-12	-- 62	-- 19	-- 19	-- SL	-- 39	-- 46	-- 30	-- 16	-- SM	-- 1.65	-- 2.59
6T-54	5448IV	790954	High	Upper slope	22	Tall scrub savanna	Rubber plantation	0-6 6-12	-- 49	-- 40	-- 11	-- VGL	-- 26	-- 56	-- 37	-- 19	-- CL	-- --	-- 3.30
6T-55	5348I	130952	High	Terrace slope	6	Low scrub; short-grass prairie	Undisturbed	0-6 6-12	-- 50	-- 34	-- 16	-- GL	-- 41	-- 29	-- 22	-- 7	-- SM-SC	-- --	-- 2.78
6T-56	5448III	820834	Low	Bottomland flat	0	Savanna	Logged	0-6 6-12	-- 55	-- 39	-- 6	-- SL	-- 54	-- 76	-- 44	-- 32	-- MH	-- --	-- 2.65
6T-57	5448III	817816	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	-- 94	-- 4	-- 2	-- S	-- 9	-- --	-- --	-- NP	-- SP-SM	-- 2.47	-- 2.63
6T-58	5349II	150065	Low	Bottomland flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	-- 55	-- 28	-- 17	-- SL	-- 51	-- 22	-- 15	-- 7	-- CL-ML	-- 0.95	-- 2.63
6T-59	5349II	159089	Low	Bottomland flat	0	Low scrub; short-grass prairie	Rubber plantation	0-6 6-12	-- 20	-- 38	-- 42	-- C	-- 83	-- 52	-- 27	-- 25	-- CH	-- 0.95	-- 2.62
6T-60	5349II	187064	High	Upland flat	0	Tall scrub forest	Undisturbed	0-6 6-12	-- 51	-- 35	-- 14	-- L	-- 59	-- 18	-- --	-- NP	-- ML	-- 0.55	-- 2.64
6T-61	5348I	152984	High	Upland flat	0	Low scrub	Undisturbed	0-6 6-12	-- 60	-- 28	-- 12	-- GSL	-- 29	-- 24	-- 16	-- 8	-- SC	-- 0.95	-- 2.99
6T-62	5448IV	767963	Low	Bottomland depression	0	Savanna	Rubber plantation	0-6 6-12	-- 70	-- 21	-- 9	-- GSL	-- 19	-- 36	-- 24	-- 12	-- SC	-- --	-- 2.85

(Continued)

(15 of 16 sheets)

Table A3 (Concluded)

Section C. Trafficability Data																					
Wet-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %				Sheargraph				Dry Density lb/cu ft	MC, %				Sheargraph				Depth to Water Table in.
				CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\phi_{ur}$		CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\phi_{ur}$	
6T-49	1	0-6	--	15.4	65	1.89	122	0.7	0.42	0.1	0.38	--	15.4	65	1.89	122	--	--	--	12	
		6-12	--	13.1	125	2.45	305					--	13.1	125	2.45	305					
6T-50	1	0-6	--	19.6	88	1.02	90	0.7	0.51	0.7	0.47										
		6-12	--	20.3	117	1.07	125														
6T-51	1	0-6	--	5.4	750+	--	--	0.0	0.78	1.2	0.30										
		6-12	--	7.4	750+	--	--														
6T-52	1	0-6	--	16.6	595	--	--	0.3	0.70	0.6	0.45										
		6-12	--	18.2	400	--	--														
6T-53	1	0-6	--	18.3	160	1.35	215	0.9	0.38	0.0	0.38										
		6-12	--	17.2	232	1.21	280														
6T-54	1	0-6	--	--	644+	--	--	1.0	0.62	0.8	0.47										
		6-12	--	--	750+	--	--														
6T-55	1	0-6	--	--	612+	--	--	1.0	0.73	0.0	0.34										
		6-12	--	--	750+	--	--														
6T-56	1	0-6	--	114.7	15	0.71	11	--	--	--	--	--	114.7	15	0.71	11	--	--	--	1	
		6-12	--	115.2	30	0.97	21					--	115.2	30	0.97	21					
6T-57	1	0-6	--	16.5	162	1.86	302	0.8	0.40	0.0	0.84										
		6-12	--	21.0	240	2.41	577														
6T-58	1	0-6	--	17.9	132	0.49	65	1.1	0.65	1.2	0.49										
		6-12	--	17.7	105	0.95	96														
6T-59	1	0-6	--	26.5	104	0.52	54	0.0	0.65	0.5	0.55										
		6-12	--	28.5	194	0.47	91														
6T-60	1	0-6	--	18.2	112	0.30	34	1.0	0.67	1.2	0.49										
		6-12	--	17.7	110	0.52	57														
6T-61	1	0-6	--	--	428+	--	--	1.8	0.58	0.8	0.36										
		6-12	--	--	750+	--	--														
6T-62	1	0-6	--	--	390	--	--	1.4	0.55	1.0	0.47										
		6-12	--	--	718+	--	--														

Table A4  
Soil Moisture-Strength Study  
Summary of Site, Soil, and Trafficability Data

Section A. Site Data									Section B. Soil Data											
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA Texture by Wt. %			Type*	Fines %	USCS Atter-berg Limits			Type	Or-ganic Content %	Spe-cific Gravity	
	Map Sheet	Grid Coor-dinates							Sand	Silt	Clay			LL	PL	PI				
Chieng Mai Area																				
PD241	4867IV	017901	Low	Bottomland flat	0	Short-grass prairie	Lawn	0-6 6-12	35 31	49 49	16 20	L E	77 75	26 25	19 18	7	CL-ML	2.87	--	
PD242	4867IV	020902	High	Terrace flat	4	Low scrub savanna	Undisturbed	0-6 6-12	73 69	20 24	7 7	SL SL	44 --	16 14	16 14	0	SM	0.78	--	
PD243	4767I	997917	Low	Bottomland flat	1	Short-grass prairie	Lawn	0-6 6-12	39 42	45 45	16 13	L L	72 69	24 18	16 13	8 5	CL CL-ML	1.55	--	
TS1	4867III	013761	High	Natural levee	0	Short-grass prairie	Lawn	0-6 6-12	39 38	42 44	19 18	L L	77 81	34 30	24 20	10 10	ML CL	2.75	--	
TS2	4867III	017765	High	Natural levee	1	Short-grass prairie	Lawn	0-6 6-12	22 20	50 50	28 --	CL CL	86 86	49 43	29 25	20 18	ML CL	3.13	--	
TS3	4767II	917791	High	Upper slope	20	Forest	Undisturbed	0-6 6-12	39 37	33 27	28 36	CL CL	73 70	65 56	45 33	20 23	MH MH	5.74	2.59	
TS4	4766I	896587	Low	Bottomland flat	0	Short-grass prairie	Cultivated	0-6 6-12	46 26	32 40	22 34	L CL	61 79	35 38	18 20	17 18	CL	2.08	2.63	
TS5	4766III	664413	Low	Terrace flat	5	Short-grass prairie	Undisturbed	0-6 6-12	67 54	22 27	11 19	SL SL	41 56	17 22	17 16	0 6	SM CL-ML	0.95	--	
TS6	4766III	654433	Low	Terrace flat	2	Short-grass prairie	Cultivated	0-6 6-12	31 32	47 50	22 18	L L	72 79	42 30	21 17	21 13	CL	1.45	--	
TS7	4766III	657445	Low	Terrace flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	85 86	9 9	6 5	LS LS	21 17	--	--	NP	SM	0.46	--	
TS19B	4867IV	165867	Low	Terrace flat	0	Woodland	Undisturbed	0-6 6-12	71 79	22 16	7 5	SL LS	43 32	--	--	NP	SM	0.70	--	
TS19C	4867IV	162866	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	71 69	21 13	8 18	SL SL	36 37	--	--	NP	SM	0.86	--	
TS19E	4867IV	161862	High	Lower slope	3	Low scrub	Cultivated	0-6 6-12	77 75	20 21	3 4	LS LS	32 33	--	--	NP	SM	0.46	--	
Khon Kaen Area																				
PD246	5560II	667076	High	Terrace flat	1	Short-grass prairie	Cultivated	0-6 6-12	78 77	15 15	7 8	LS SL	33 37	16 14	16 14	0	SM	0.95	--	
PD247	5560II	666077	Low	Bottomland flat	0	Short-grass prairie	Grazed	0-6 6-12	70 62	19 26	11 12	SL SL	43 48	17 14	17 14	0	SM	1.05	2.61	
PD248	5560II	662083	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	76 75	17 17	7 8	SL SL	38 39	16 14	16 14	0	SM	0.78	--	
PD249	5560II	657085	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	61 61	27 23	12 16	SL SL	57 57	20 18	18 17	2 1	ML	0.78	2.62	
TS9	5560II	689234	Low	Upland flat	1	Tall-grass prairie	Cultivated	0-6 6-12	75 81	20 14	5 5	LS LS	32 31	--	--	NP	SM	0.86	--	
TS10	5560II	689230	High	Upper slope	3	Low scrub savanna	Cultivated	0-6 6-12	68 74	24 18	8 8	SL SL	43 39	17 --	15 --	2 NP	SM	0.78	--	
TS11	5560II	658190	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	82 77	13 20	5 3	LS LS	33 40	--	--	NP	SM	0.46	--	
TS12	5560II	657099	High	Natural levee	1	Short-grass prairie	Grazed	0-6 6-12	48 41	41 42	11 17	L L	71 76	27 26	22 20	5 6	ML CL-ML	0.86	--	
TS13	5560II	658089	High	Natural levee	1	Short-grass prairie	Grazed	0-6 6-12	43 43	44 43	13 14	L L	80 80	30 25	23 19	7 6	ML CL-ML	1.65	--	
TS14	5560II	659085	Low	Bottomland flat	0	Short-grass prairie	Cultivated (grazed)	0-6 6-12	26 13	46 51	28 36	CL SICL	84 93	17 41	19 18	18 23	CL	1.45	--	
TS56A	5560II	749173	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	43 41	34 35	23 24	L L	67 68	26 32	14 17	12 15	CL	0.70	--	
TS56B	5560II	748173	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	47 41	32 35	21 24	L L	66 74	26 32	15 17	11 15	CL	0.62	--	
TS56D	5560II	747172	Low	Terrace slope	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	-- 44	-- 33	-- 23	-- L	-- 66	-- 29	-- 18	-- 11	-- CL	0.86	--	
Nakhon Sawan Area																				
PD251	5058III	215324	High	Terrace flat	1	Short-grass prairie	Lawn	0-6 6-12	25 25	44 40	31 35	CL CL	80 81	47 48	21 23	26 25	CL	2.87	--	
TS15	4958II	026467	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	20 11	48 41	32 48	SICL SIC	86 92	32 45	19 22	13 23	CL	1.45	--	

(Continued)

\* G = gravelly; VG = very gravelly.

(1 of 6 sheets)



Table A4 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft					Sheargraph**				Dry Density lb/cu ft					Sheargraph**				Depth to Water Table† in.
				MC, %	CI	RI	RCI	c <sub>u</sub> psi	Tan φ <sub>u</sub>	a <sub>ur</sub> psi	Tan φ <sub>ur</sub>		MC, %	CI	RI	RCI	c <sub>u</sub> psi	Tan φ <sub>u</sub>	a <sub>ur</sub> psi	Tan φ <sub>ur</sub>	
Chiang Mai Area																					
PD241	19	0-6 6-12	94.8 97.6	25.9 20.5	100+ 212+	-- 0.68	-- 150+	--	--	--	--	--	28.2 19.4	35 96	-- 0.29	-- 28	--	--	--	--	1
PD242	18	0-6 6-12	93.4 97.8	12.8 11.7	156 177	-- 2.60	-- 472	3.2	0.58	0.7	0.43										
PD243	18	0-6 6-12	97.9 109.8	20.4 15.0	192+ 348+	-- 0.58	-- 184+	3.8	0.58	0.9	0.70	98.7 113.8	19.2 15.3	90 121	-- 0.44	-- 53					23
TS1	14	0-6 6-12	86.2 89.3	19.4 15.6	497+ 661+	-- 1.01	-- 491+	--	--	--	--										
TS2	16	0-6 6-12	79.5 84.9	28.8 26.2	191 265+	-- 1.02	-- 247	3.1	0.68	0.2	0.63										
TS3	10	0-6 6-12	67.8 63.5	42.3 33.7	60 106	-- 1.26	-- 141	2.6	0.68	0.7	0.70										
TS4	14	0-6 6-12	89.8 98.0	29.0 25.2	68 126	-- 0.86	-- 109	3.3	0.19	1.6	0.19	-- --	29.6 25.1	51 102	-- 0.69	-- 70					0
TS5	15	0-6 6-12	91.1 89.3	11.8 11.5	297+ 369+	-- 1.64	-- 421+	1.5	0.78	1.2	0.75										
TS6	19	0-6 6-12	91.7 104.6	28.9 21.2	78 137+	-- 0.78	-- 103+	--	--	--	--	--	34.5 23.6	60 129	-- 0.35	-- 45					0
TS7	8	0-6 6-12	88.3 86.6	28.6 28.8	173 279	-- 0.99	-- 276	--	--	--	--	--	29.3 29.9	136 224	-- 0.77	-- 172					0
TS19B	8	0-6 6-12	93.2 95.4	17.2 14.3	263 297	-- --	-- --	--	--	--	--										
TS19C	9	0-6 6-12	96.0 101.6	21.9 17.5	170 167	-- 0.37	-- 62	--	--	--	--	--	21.6 20.1	169 147	-- 0.17	-- 25					1
TS19E	9	0-6 6-12	90.2 94.0	11.2 10.2	142 239	-- 2.14	-- 474	--	--	--	--										
Khon Kaen Area																					
PD246	7	0-6 6-12	96.4 100.1	12.1 11.7	181+ 230+	-- 2.15	-- 442+	0.6	0.76	0.3	0.60										
PD247	6	0-6 6-12	101.1 105.2	17.3 16.5	151 200+	-- 0.55	-- 117+	--	--	--	--	--	16.2 17.1	92 153+	-- 0.35	-- 54+					1
PD248	7	0-6 6-12	99.7 104.6	18.9 15.6	184+ 344+	-- 0.86	-- 332+	0.8	0.68	0.8	0.47	--	19.1 15.1	188+ 406+	-- 0.29	-- 118+					0
PD249	7	0-6 6-12	95.8 97.4	17.5 15.1	211+ 504+	-- 1.09	-- 547+	0.6	0.84	0.9	0.32	--	18.8 16.6	185 388+	-- 0.80	-- 310+					18
TS9	6	0-6 6-12	97.5 99.1	12.4 12.2	87 160+	-- 1.59	-- 242+	0.8	0.58	0.4	0.60										
TS10	4	0-6 6-12	89.5 93.2	13.9 13.4	95 101	-- 1.87	-- 193	1.1	0.54	0.6	0.47										
TS11	4	0-6 6-12	102.6 103.5	16.2 16.1	180 240	-- 0.78	-- 190	0.7	0.49	0.6	0.47	--	17.0 16.8	187 246	-- 0.42	-- 103	0.7	0.49	0.6	0.47	4
TS12	6	0-6 6-12	96.8 97.2	19.3 20.4	182 178	-- 0.62	-- 102	2.2	0.44	0.2	0.50										
TS13	7	0-6 6-12	91.1 92.4	19.5 20.1	191+ 157	-- 0.69	-- 115	2.2	0.64	0.5	0.54										
TS14	6	0-6 6-12	92.8 91.0	22.3 26.2	215+ 206+	-- 0.98	-- 209+	0.0	1.15	0.0	0.58	--	27.2 28.1	68 115	-- 0.76	-- 87	0.0	1.15	0.0	0.58	3
TS56A	4	0-6 6-12	91.9 95.4	19.7 20.0	118 214+	-- 0.90	-- 197+	--	--	--	--	95.4 97.6	19.7 20.4	94 172	-- 0.78	-- 134					6
TS56B	3	0-6 6-12	98.0 99.3	21.3 21.9	86 117	-- 0.78	-- 91	--	--	--	--	--	21.6 22.0	82 101	-- 0.76	-- 77					0
TS56D	3	0-6 6-12	99.5 93.0	17.4 21.1	131 123	-- 0.74	-- 91	--	--	--	--	98.2 92.3	17.3 20.7	142 116	-- 0.73	-- 85					20
Nakhon Sawan Area																					
PD251	8	0-6 6-12	81.2 89.3	21.8 21.7	232+ 362+	-- 1.12	-- 366+	2.2	0.52	3.0	0.55										
TS15	9	0-6 6-12	74.9 83.0	26.2 25.2	112+ 229+	-- 1.09	-- 246+	3.7	0.43	1.5	0.65	--	25.9 25.4	66 122	-- 0.88	-- 107					0

(Continued)

\*\*  $c_u$ , ultimate soil-to-soil cohesion;  $\phi_u$ , ultimate soil-to-soil angle of internal friction;  $a_{ur}$ , ultimate soil-to-rubber adhesion;  
 $\phi_{ur}$ , ultimate soil-to-rubber angle of friction.

† Plus (+) denotes depth of water above surface.

(2 of 3 sheets)

Table A4 (Continued)

Section A. Site Data								Section E. Soil Data												
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				Type	USCS				Type	Or-ganic Con-tent %	Spe-cific Grav-ity
	Map Sheet	Grid Coor-di-nates							Texture by Wt. %			Fines %		Atter-berg Limits						
									Sand	Silt	Clay			LL	PL	PI				
TS16	5058III	171364	Low	Bottomland depression	1	Low scrub savanna	Cultivated	0-6 6-12	10 5	34 33	56 62	C C	96 98	64 81	32 35	32 46	MH CH	2.35 1.88	-- 2.70	
TS17	5057IV	206249	Low	Bottomland flat	1	Short-grass prairie	Cultivated	0-6 6-12	44 41	34 33	22 26	L L	67 68	40 43	20 24	20 19	CL CL	2.87 2.35	2.67 --	
TS18	5057IV	207239	Low	Bottomland flat	0	Short-grass prairie	Cultivated	0-6 6-12	62 59	29 27	9 14	SL SL	54 53	20 19	16 14	4 5	CL-ML CL-ML	0.95 0.62	-- --	
TS19	5057III	252102	Low	Bottomland flat	0	Short-grass prairie	Cultivated	0-6 6-12	59 49	28 33	13 18	SL L	47 57	19 24	11 12	8 12	SC CL	0.95 0.70	-- 2.64	
TS20	5057III	427103	High	Terrace flat	3	Short-grass prairie	Cultivated (idle)	0-6 6-12	17 16	43 41	40 43	S1C S1C	86 89	67 68	31 29	36 39	CH CH	3.54 2.75	-- 2.69	
Lop Buri Area																				
PD252	5155II	937287	Low	Bottomland flat	0	Low scrub savanna	Cultivated	0-6 6-12	12 11	50 47	38 42	S1CL S1C	95 93	78 88	45 53	33 35	MH CH	3.27 3.00	-- 2.69	
PD253	5155II	943282	High	Terrace flat	1	Short-grass prairie	Lawn	0-6 6-12	12 10	49 46	39 44	S1CL S1C	93 96	69 72	30 33	39 39	CH CH	3.27 2.75	-- 2.66	
PD254	5155II	951285	High	Lower slope	6	Low scrub savanna	Cultivated	0-6 6-12	12 14	39 51	49 35	C S1CL	88 93	53 63	30 31	23 32	MH CH	2.87 2.08	-- 2.69	
PD255	5254IV	213155	Low	Bottomland flat	1	Short-grass prairie	Grazed	0-6 6-12	28 30	47 46	25 24	L L	83 84	36 36	18 24	18 12	CL CL	1.65 1.77	-- 2.63	
PD256	5254IV	220162	Low	Terrace flat	1	Short-grass prairie	Grazed	0-6 6-12	28 27	38 37	34 36	CL CL	83 84	58 62	25 26	33 36	CH CH	2.23 1.77	-- 2.71	
TS21	5155IV	771468	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	30 30	36 33	34 37	CL CL	78 79	53 55	18 18	35 37	CH CH	1.25 1.05	-- 2.70	
TS22	5155IV	794479	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	36 34	33 34	31 32	CL CL	74 78	49 47	20 17	29 30	CL CL	1.05 1.05	-- --	
TS23	5155IV	808487	Low	Bottomland flat	1	Low scrub savanna	Cultivated (idle)	0-6 6-12	31 27	41 39	28 34	CL CL	79 83	42 51	19 18	23 33	CL CH	1.55 1.15	-- 2.68	
TS24	5155IV	834489	Low	Lower slope	3	Savanna	Undisturbed	0-6 6-12	43 41	32 28	25 31	L CL	70 70	37 41	21 23	16 18	CL CL	2.60 1.65	-- 2.82	
TS25	5154I	071039	Low	Terrace flat	0	Short-grass prairie	Cultivated	0-6 6-12	9 12	84 78	7 10	S1 S1L	96 94	17 16	17 16	0 0	ML ML	0.85 0.62	-- 2.60	
TS25A	5154II	084012	Low	Terrace flat	0	Savanna	Cultivated (idle)	0-6 6-12	30 29	58 51	12 20	S1L S1L	78 80	27 21	22 19	5 2	ML ML	1.05 0.62	-- --	
TS25B	5154II	084013	Low	Terrace flat	0	Tall scrub savanna	Grazed	0-6 6-12	42 43	42 41	16 16	L L	66 44	29 23	22 17	7 6	ML SM-SC	1.05 0.62	-- --	
TS26	5153I	912764	Low	Bottomland flat	0	Short-grass prairie	Cultivated	0-6 6-12	16 13	49 49	35 38	S1CL S1CL	80 97	75 74	38 31	37 43	MH CH	3.20 2.08	-- --	
Bangkok Area																				
PD244	5152III	740113	Low	Bottomland depression	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	6 6	41 37	53 57	S1C C	99 99	72 67	27 23	45 44	CH CH	1.98 1.55	-- 2.68	
PD245	5152IV	711319	Low	Bottomland flat	1	Short-grass prairie	Cultivated	0-6 6-12	11 11	41 41	48 48	S1C S1C	98 98	67 66	29 27	38 39	CH CH	3.00 1.65	2.68 --	
TS8	5052II	592229	Low	Bottomland flat	0	Short-grass prairie	Cultivated	0-6 6-12	13 12	43 41	44 47	S1C S1C	94 94	65 66	29 29	36 37	CH CH	2.08 1.45	-- 2.71	
Fran Buri Area																				
PD257	4948I	040904	High	Terrace flat	1	Short-grass prairie	Lawn	0-6 6-12	72 75	23 19	5 6	SL SL	37 33	-- --	-- --	NP NP	SM SM	0.70 0.55	-- --	
TS29	4948II	062776	Low	Bottomland flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	68 54	21 17	11 29	SL SCL	45 49	18 28	13 11	5 17	SM-SC SC	0.78 0.55	2.63 --	
TS30	4948II	053772	High	Terrace slope	3	Tall scrub savanna	Cultivated	0-6 6-12	64 62	24 24	12 12	SL SL	51 48	18 17	15 13	3 4	ML SM-SC	1.05 0.62	-- 2.67	
TS31	4948II	951732	High	Terrace flat	0	Tall scrub woodland	Undisturbed	0-6 6-12	44 38	45 44	11 18	L L	70 73	21 20	15 13	6 7	CL-ML CL-ML	1.33 0.78	-- --	
TS32	4948II	944730	High	Terrace flat	1	Tall-grass prairie	Undisturbed	0-6 6-12	48 43	40 43	12 14	L L	64 66	18 17	14 12	4 5	CL-ML CL-ML	0.95 0.78	-- --	
TS33	4948II	925730	High	Terrace flat	0	Low scrub	Undisturbed	0-6 6-12	27 30	55 46	18 24	S1L L	85 86	28 23	19 16	9 7	CL CL-ML	1.65 0.95	-- --	
TS34	4948II	967679	High	Terrace flat	1	Short-grass prairie	Cultivated (idle)	0-6 6-12	39 34	43 39	18 27	L L	76 80	26 27	15 14	9 13	CL CL	1.65 1.15	-- 2.65	

(Continued)

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Table A4 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition													High-Moisture Condition								
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %				Sheargraph				Dry Density lb/cu ft	MC, %				Sheargraph				Depth to Water Table in.
				CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi$ u	a <sub>ur</sub> psi	Tan $\alpha$ ur		CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi$ u	a <sub>ur</sub> psi	Tan $\alpha$ ur	
TS16	6	0-6 6-12	84.7 82.1	32.8 37.4	89 121	-- 1.15	-- 126	0.7	0.70	1.3	0.43	-- --	37.5 37.3	52 96	-- 1.05	-- 101				22	
TS17	8	0-6 6-12	94.9 97.5	21.3 22.0	144+ 226+	-- 1.10	-- 242+	3.5	0.45	1.3	0.51										
TS18	8	0-6 6-12	91.1 86.2	13.5 7.2	453+ 746+	-- --	-- --	2.2	0.43	1.4	0.40	-- --	16.0 7.1	378+ 722+	-- --	-- --				0	
TS19	4	0-6 6-12	112.1 109.9	14.0 18.1	108 125	-- 0.63	-- 79	3.0	0.43	2.0	0.45	-- --	15.0 19.2	62 105	-- 0.53	-- 56				0	
TS20	8	0-6 6-12	76.8 74.3	28.6 28.7	186+ 271+	-- 1.20	-- 285+	3.7	0.49	1.9	0.38										
Lop Buri Area																					
PD252	13	0-6 6-12	63.1 66.8	38.6 38.2	125 203	-- 1.12	-- 228	2.7	0.28	0.9	0.65	-- --	39.0 41.9	117 154	-- 1.06	-- 163				48	
PD253	13	0-6 6-12	72.1 76.7	35.4 33.5	126 233+	-- 1.12	-- 263+	5.4	0.28	0.6	0.30										
PD254	13	0-6 6-12	77.0 88.6	30.6 31.5	97 252+	-- 1.18	-- 279+	3.0	0.32	1.6	0.34										
PD255	14	0-6 6-12	87.5 95.1	26.5 24.0	100 124	-- 0.94	-- 117	3.8	0.97	0.8	0.70	-- --	29.1 27.2	70 88	-- 0.92	-- 81				3	
PD256	14	0-6 6-12	87.7 90.8	28.1 26.3	136 168	-- 1.07	-- 180	2.6	0.84	0.9	0.68	-- --	30.5 27.3	96 108	-- 1.01	-- 109				24	
TS21	9	0-6 6-12	95.0 97.1	25.1 24.2	100 106	-- 1.08	-- 115	2.6	0.58	0.6	0.50	-- --	27.9 26.6	55 61	-- 1.22	-- 74				29	
TS22	7	0-6 6-12	95.0 94.9	27.0 25.0	66 121+	-- 0.92	-- 108+	4.3	0.47	2.1	0.45	-- --	28.4 25.8	65 91	-- 0.68	-- 62				20	
TS23	10	0-6 6-12	90.8 90.9	28.8 25.3	74 225+	-- 1.07	-- 245+	3.1	0.32	0.7	0.48	-- --	38.5 25.4	51 187+	-- 0.59	-- 110+	1.8	0.02	0.1	0.18	9
TS24	9	0-6 6-12	87.7 85.9	26.0 26.0	146+ 236+	-- 1.16	-- 278+	1.8	0.54	1.0	0.49	-- --	26.6 27.6	111 159	-- 0.99	-- 157	0.7	0.36	1.3	0.40	0
TS25	10	0-6 6-12	82.4 104.3	16.3 12.2	622+ 750+	-- --	-- --	-- --	-- --	-- --	-- --	-- --	17.7 13.0	614+ 750+	-- --	-- --				0	
TS25A	5	0-6 6-12	91.8 98.0	24.6 20.5	288+ 395+	-- 0.37	-- 137+	-- --	-- --	-- --	-- --										
TS25B	5	0-6 6-12	98.6 96.5	22.5 21.5	223 265+	-- 0.54	-- 141+	-- --	-- --	-- --	-- --	-- --	23.5 21.7	119 152	-- 0.54	-- 82				0	
TS26	11	0-6 6-12	64.1 78.7	51.8 39.7	121 147	-- 0.84	-- 125	-- --	-- --	-- --	-- --	-- --	58.4 44.8	116 139	-- 0.50	-- 70				2	
Bangkok Area																					
PD244	15	0-6 6-12	76.0 86.4	39.5 35.0	47 72	-- 0.97	-- 70	-- --	-- --	-- --	-- --	-- --	41.7 37.4	32 57	-- 0.80	-- 46				0	
PD245	12	0-6 6-12	78.8 82.6	34.8 34.2	103 114	-- 0.99	-- 105	-- --	-- --	-- --	-- --	-- --	38.2 35.1	55 61	-- 0.75	-- 46				0	
TS8	17	0-6 6-12	74.6 72.7	44.3 49.1	63 64	-- 0.93	-- 59	3.5	0.18	1.4	0.19	-- --	52.2 56.8	47 55	-- 0.64	-- 35				0	
Fran Buri Area																					
PD257	3	0-6 6-12	104.0 101.4	12.9 10.1	203+ 248+	-- 1.57	-- 257	2.5	0.54	0.0	0.63										
TS29	11	0-6 6-12	109.5 112.7	14.6 16.5	308 263	-- 0.86	-- 227	2.8	0.45	0.1	0.40	113.8 113.6	16.6 16.8	249 174	-- 0.74	-- 129				0	
TS30	4	0-6 6-12	101.0 112.0	15.4 13.6	72 144+	-- 1.18	-- 188+	-- --	-- --	-- --	-- --										
TS31	5	0-6 6-12	95.6 99.0	17.2 16.8	77 70+	-- 0.72	-- 55+	3.0	0.73	0.7	0.56										
TS32	6	0-6 6-12	97.4 101.2	15.2 13.2	81 90+	-- 0.92	-- 110+	3.2	0.44	1.8	0.60										
TS33	5	0-6 6-12	94.7 103.8	20.8 16.9	132 148+	-- 0.76	-- 117+	4.4	0.46	1.7	0.54										
TS34	4	0-6 6-12	95.5 97.8	18.8 17.7	41 66	-- 1.18	-- 95	2.4	0.63	1.4	0.63										

(Continued)

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Table A4 (Continued)

Section A. Site Data								Section B. Soil Data															
Location			Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA			USCS				Type	Fines %	Atter-berg Limits			Type	Or-ganic Con-tent %	Spe-cific Grav-ity
Site No.	Map Sheet	Grid Coor-di-nates							Texture by Wt. %			Type	LL	PL	PI								
									Sand	Silt	Clay												
Chanthaburi Area																							
PD258	5448IV	857957	High	Upper slope	2	Short-grass prairie	Cultivated (idle)	0-6 6-12	25 23	36 36	39 41	CL C	82 83	50 50	29 28	21 22	MH CH	3.27 1.58	-- 2.67				
PD259	5448IV	805932	High	Upper slope	2	Short-grass prairie	Cultivated	0-6 6-12	28 24	47 47	25 29	L CL	90 90	53 56	40 42	13 14	MH MH	3.00 2.75	2.88 2.88				
TS35	5149II	059028	High	Terrace flat	0	Forest	Cultivated	0-6 6-12	51 61	40 25	9 14	L SL	48 51	16 15	14 11	2 4	SM CL-ML	0.79 0.55	-- --				
TS36	5149II	060039	High	Terrace slope	4	Tall scrub woodland	Cultivated	0-6 6-12	47 41	35 37	18 22	L L	63 67	25 27	15 16	10 11	CL CL	1.55 0.78	-- 2.69				
TS37	5249III	319085	High	Lower slope	2	Short-grass prairie	Lawn	0-6 6-12	63 61	11 9	26 30	SCL SCL	41 44	25 28	13 14	12 14	SC SC	1.45 1.33	-- 2.61				
TS38	5249III	385046	Low	Bottomland flat	2	Short-grass prairie	Cultivated (grazed)	0-6 6-12	16 19	43 46	41 35	S1C S1CL	93 89	107 96	75 68	32 28	MH MH	2.60 12.35	2.29 2.40				
TS39	5249II	484093	Low	Bottomland flat	1	Short-grass prairie	Cultivated	0-6 6-12	76 68	20 19	4 13	LS SL	35 43	-- 13	-- 13	NP 0	SM SM	0.86 0.46	-- 2.62				
TS40	5448IV	881961	Low	Bottomland flat	0	Short-grass prairie	Lawn	0-6 6-12	7 8	52 51	41 41	S1C S1C	92 92	71 66	46 38	25 28	MH MH	4.15 3.62	-- 2.57				
TS41	5448IV	929843	Low	Terrace flat	2	Woodland	Cultivated	0-6 6-12	71 66	9 11	20 23	SL SCL	34 39	29 25	20 14	9 11	SC SC	1.77 1.25	-- 2.60				
TS42	5448IV	934846	High	Lower slope	3	Tall scrub savanna	Cultivated	0-6 6-12	58 57	16 14	26 29	SCL SCL	43 43	43 42	25 23	18 19	SC SC	3.41 2.87	-- 2.61				
Hat Yai Area																							
PD260	5132III	657756	High	Terrace flat	1	Woodland	Cultivated	0-6 6-12	61 65	31 22	8 13	SL SL	51 51	22 19	18 15	4 4	CL-ML CL-ML	1.45 0.78	-- 2.64				
TS43	5032III	354874	Low	Natural levee	1	Low scrub	Cultivated	0-6 6-12	56 52	28 30	16 18	SL SL	58 59	33 31	22 20	11 11	CL CL	2.23 1.15	-- --				
TS44	5032II	430760	High	Lower slope	5	Forest	Undisturbed	0-6 6-12	53 50	38 34	9 16	SL GL	55 28	21 26	18 17	3 9	ML GC	1.77 0.78	-- 2.96				
TS45	5132III	667752	High	Lower slope	8	Woodland	Cultivated	0-6 6-12	58 53	25 26	17 21	SL SCL	49 46	27 29	18 18	9 11	SC SC	1.98 1.65	-- --				
TS46	5132III	659761	Low	Bottomland flat	1	Short-grass prairie	Cultivated (grazed)	0-6 6-12	38 43	48 43	14 14	L L	74 70	34 21	24 16	10 5	ML CL-ML	2.35 0.95	-- 2.63				
TS47	5132III	702814	High	Lower slope	2	Forest	Cultivated	0-6 6-12	35 32	38 32	27 35	CL CL	75 62	58 58	32 33	26 25	MH MH	3.96 1.15	-- 2.87				
TS48	5132III	706814	Low	Bottomland flat	0	Short-grass prairie	Cultivated	0-6 6-12	32 29	54 47	14 24	S1L L	79 80	23 26	15 14	8 12	CL CL	1.33 0.70	-- 2.67				
TS49	5132III	785925	Low	Terrace flat	0	Short-grass prairie	Cultivated (idle)	0-6 6-12	25 19	47 40	28 41	CL C	82 88	103 70	68 35	35 35	MH MH	14.35 4.90	-- --				
TS50	5132IV	770946	Low	Terrace flat	0	Low scrub savanna	Undisturbed	0-6 6-12	95 93	4 4	1 3	S S	7 10	-- --	-- --	NP NP	SP-SM SP-SM	2.75 3.54	-- 2.57				

(Continued)

(5 of 6 sheets)



Table A4 (Concluded)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft					Sheargraph				Dry Density lb/cu ft					Sheargraph				Depth to Water Table in.
				MC, %	CI	RI	RCI	c <sub>u</sub> psi	Tan φ <sub>u</sub>	a <sub>ur</sub> psi	Tan α <sub>ur</sub>		MC, %	CI	RI	RCI	c <sub>u</sub> psi	Tan φ <sub>u</sub>	a <sub>ur</sub> psi	Tan α <sub>ur</sub>	
Chanthaburi Area																					
PD258	13	0-6 6-12	86.4 84.2	30.9 29.4	160 206	-- 1.06	-- 220	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
PD259	12	0-6 6-12	62.2 63.4	43.4 43.5	78 132	-- 1.34	-- 181	3.7 --	0.70 --	0.0 --	0.65 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS35	8	0-6 6-12	106.8 110.4	12.7 12.4	77 103	-- 0.69	-- 78	2.1 --	0.65 --	0.2 --	0.56 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS36	8	0-6 6-12	102.7 101.6	16.2 15.2	126 190+	-- 0.88	-- 166+	3.9 --	0.65 --	0.5 --	0.60 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS37	8	0-6 6-12	102.8 101.8	12.4 13.7	234+ 343+	-- 1.23	-- 460+	4.2 --	0.23 --	1.5 --	0.36 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS38	8	0-6 6-12	46.9 45.3	89.8 114.2	120 120	-- 0.48	-- 56	-- --	-- --	-- --	-- --	-- --	93.7 105.4	118 113	-- 0.30	-- 34	-- --	-- --	-- --	-- --	0
TS39	6	0-6 6-12	102.6 116.6	18.6 13.7	146 292+	-- 0.65	-- 193+	-- --	-- --	-- --	-- --	-- --	21.7 15.0	85 183+	-- 0.48	-- 88+	-- --	-- --	-- --	-- --	-- --
TS40	10	0-6 6-12	67.9 67.5	50.0 50.9	126 126	-- 0.74	-- 94	-- --	-- --	-- --	-- --	68.6 66.2	49.9 53.6	94 108	-- 0.54	-- 58	-- --	-- --	-- --	-- --	10
TS41	10	0-6 6-12	92.2 98.8	19.3 18.9	98 160+	-- 0.94	-- 153+	-- --	-- --	-- --	-- --	-- --	24.9 23.3	73 111	-- 0.52	-- 58	-- --	-- --	-- --	-- --	16
TS42	10	0-6 6-12	69.3 71.8	22.0 21.7	121 199+	-- 1.02	-- 204+	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
Nat Yoi Area																					
PD260	4	0-6 6-12	93.1 98.7	15.4 14.5	110 166	-- 1.44	-- 250	1.1 --	0.54 --	0.4 --	0.56 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS43	6	0-6 6-12	93.0 98.4	22.4 20.1	101 117	-- 0.88	-- 106	2.3 --	0.47 --	1.6 --	0.32 --	89.0 95.8	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS44	7	0-6 6-12	98.8 104.8	17.0 14.0	326+ 617+	-- 0.45	-- 253+	2.4 --	0.58 --	0.6 --	0.58 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS45	4	0-6 6-12	97.2 98.6	16.4 15.2	264+ 491+	-- 1.32	-- 580+	2.0 --	0.59 --	0.3 --	0.64 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS46	16	0-6 6-12	89.3 112.6	32.0 17.8	82 177+	-- 0.86	-- 149+	-- --	-- --	-- --	-- --	80.3 115.4	41.4 17.7	62 140+	-- 0.46	-- 64+	-- --	-- --	-- --	-- --	0
TS47	10	0-6 6-12	81.9 87.8	32.8 28.6	137 230+	-- 1.22	-- 291+	2.5 --	0.67 --	1.5 --	0.50 --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
TS48	14	0-6 6-12	109.1 114.8	21.5 16.4	176+ 292+	-- 0.71	-- 481+	3.2 --	0.38 --	3.1 --	0.60 --	10.4 112.4	20.9 16.6	110 134	-- 0.53	-- 71	-- --	-- --	-- --	-- --	0
TS49	13	0-6 6-12	48.2 74.5	82.6 51.3	100 116	-- 0.82	-- 96	1.4 --	0.38 --	0.0 --	0.49 --	-- --	73.5 46.0	88 87	-- 0.67	-- 58	-- --	-- --	-- --	-- --	16
TS50	7	0-6 6-12	82.8 83.2	18.5 22.4	100 142	-- 1.87	-- 264	2.4 --	0.47 --	0.4 --	0.53 --	79.2 80.9	16.8 26.2	78 125	-- 1.61	-- 201	-- --	-- --	-- --	-- --	22

Table A5  
CRREL Airphoto Pattern Study  
Summary of Site, Soil, and Trafficability Data

Section A. Site Data								Section B. Soil Data											
Site No.	Location		Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA			USCS				Type	Or-ganic Con-tent %	Spe-cific Grav-ity	
	Map Sheet	Grid Coor-dinates							Texture by Wt. %			By Wt. %	Atter-berg Limits						
									Sand	Silt	Clay		LL	PL	PI				
Lop Buri Area																			
1	5154I	946123	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	9 9	65 66	26 25	S1L S1L	94 93	44 57	21 22	23 35	CL CH	0.92 0.74	2.68 2.65
2	5153IV	820785	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	5 7	67 67	28 26	S1CL S1L	97 95	57 69	29 25	28 44	CH CH	2.41 0.97	2.65 2.74
4	5155II	992256	High	Upland flat	--	--	Cultivated	0-6 6-12	48 48	39 39	13 13	L L	60 60	48 48	25 25	23 23	CL CL	3.41 3.41	2.69 2.69
5	5155II	923265	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	21 18	69 71	10 11	S1L S1L	88 87	90 70	40 27	50 43	MH CH	2.67 2.72	2.59 2.77
6	5154IV	868128	Low	Natural levee	--	--	Cultivated	0-6 6-12	10 11	66 64	24 25	S1L S1L	95 93	62 59	22 28	40 31	CH CH	1.55 0.82	2.63 2.70
7	5155II	960348	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	21 11	69 81	10 8	S1L S1	88 94	79 84	37 30	42 54	MH CH	2.35 1.82	2.74 2.73
11	51552II	618387	Low	Natural levee	--	--	Cultivated	0-6 6-12	10 17	63 63	27 20	S1L S1L	94 89	51 46	29 24	22 22	MH CL	1.67 1.00	2.69 2.70
14	5154II	139879	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	6 3	81 79	13 18	S1L S1L	96 98	28 28	23 21	5 7	ML CL-ML	1.33 --	2.60 2.60
17	5154I	023087	Low	Natural levee	--	--	Cultivated	0-6 6-12	23 25	67 62	10 13	S1L S1L	83 81	38 47	28 20	10 27	ML CL	1.15 0.51	2.71 2.70
19	5154I	045089	Low	Terrace flat	--	--	Cultivated	0-6 6-12	14 13	66 65	20 22	S1L S1L	90 92	52 54	25 24	27 30	CH CH	1.00 0.70	2.67 2.67
20	5154I	048093	Low	Natural levee	--	--	Cultivated	0-6 6-12	20 7	67 65	13 28	S1L S1CL	85 94	35 57	22 22	13 35	CL CH	1.10 0.74	2.72 2.64
21	5154I	021130	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	10 44	80 50	10 6	S1 S1L	94 59	40 32	16 22	24 10	CL CL	1.15 0.51	2.60 2.59
23	5154I	053164	High	Lower slope	--	--	Cultivated	0-6 6-12	19 17	70 66	11 17	S1L S1L	87 88	45 51	16 21	29 30	CL CH	1.15 0.59	2.62 2.71
27	5154III	623946	Low	Natural levee	--	--	Cultivated	0-6 6-12	14 13	68 71	18 16	S1L S1L	91 92	48 39	25 24	23 15	CL CL	1.10 1.05	2.74 2.73
28	5154III	657860	Low	Bottomland flat	--	--	Undisturbed	0-6 6-12	9 13	66 62	25 25	S1L S1L	95 92	58 53	26 27	27 26	CH CH	2.94 1.45	2.72 2.76
30	5153I	891751	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	35 25	44 50	21 25	L S1L	70 79	63 69	24 35	39 34	CH MH	3.82 2.16	2.68 2.66
31	5153I	948788	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	16 17	62 56	22 27	S1L S1L	89 87	68 62	31 27	37 35	CH CH	1.65 0.87	2.71 2.69
33	5153I	963793	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	18 22	54 47	28 31	S1CL CL	87 83	73 79	44 39	29 40	MH MH	4.70 4.20	2.58 2.59
37	5154II	040917	Low	Terrace flat	--	--	Cultivated	0-6 6-12	38 41	57 43	5 16	S1L L	74 70	17 25	16 15	1 10	ML CL	0.70 0.63	2.68 2.65
39	5154II	071927	Low	Lower slope	--	--	Cultivated	0-6 6-12	33 29	66 70	1 1	S1L S1L	79 81	-- 19	-- 19	NP 0	ML ML	0.63 0.36	2.65 2.60
41	5154II	081873	Low	Bottomland flat	--	--	--	0-6 6-12	18 33	55 52	27 15	S1L S1L	87 78	40 20	24 17	16 3	CL ML	1.20 0.74	2.68 2.64
44	5154II	908952	Low	Natural levee	--	--	Cultivated	0-6 6-12	14 15	55 50	31 35	S1CL S1CL	90 89	56 63	27 40	29 23	CH MH	1.98 1.44	2.61 2.61
46	5154II	046963	Low	Natural levee	--	--	Cultivated	0-6 6-12	10 6	67 60	23 34	S1L S1CL	94 96	44 61	25 35	19 26	CL MH	0.87 0.78	2.64 2.66
47	5154II	052974	High	Lower slope	--	--	--	0-6 6-12	69 75	29 24	2 1	SL LS	39 32	-- --	-- --	NP NP	SM SM	0.67 --	2.60 2.65
48	5154II	069035	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	15 20	84 72	1 8	S1 S1L	90 85	19 17	18 16	1 1	ML ML	0.70 0.74	2.60 2.60
49	5154I	123124	Low	Terrace flat	--	--	Cultivated	0-6 6-12	59 58	32 35	9 7	SL SL	58 58	27 21	26 --	1 NP	ML ML	1.10 --	2.61 2.65
50	5154I	116087	Low	Natural levee	--	--	Cultivated	0-6 6-12	18 18	58 50	24 32	S1L S1CL	86 84	39 54	21 22	18 32	CL CH	-- --	2.70 2.76
54	5154I	011092	Low	Natural levee	--	--	Cultivated	0-6 6-12	18 5	50 61	32 34	S1CL S1CL	86 96	39 49	21 23	18 26	CL CL	-- --	2.65 2.69
56	5154I	972100	Low	Terrace flat	--	--	Cultivated	0-6 6-12	21 23	67 77	12 0	S1L S1L	86 83	27 40	21 18	6 22	CL-ML CL	-- --	2.62 2.69

(Continued)

\* G = gravelly; VG = very gravelly.

(1 of 8 sheets)

Table A5 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph***				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph***				Depth to Water Table† in.
								c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\alpha_{ur}$						c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\alpha_{ur}$	
Lop Euri Area																					
1	1	0-6 6-12	-- --	26.2 33.6	92 112	-- --	-- --														
2	1	0-6 6-12	-- --	21.8 28.0	112 127	-- --	-- --														
4	1	0-6 6-12	-- --	-- --	-- --	-- --	-- --														
5	1	0-6 6-12	-- --	38.2 33.7	82 82	-- --	-- --														
6	1	0-6 6-12	-- --	34.0 30.6	45 98	-- --	-- --														
7	1	0-6 6-12	-- --	40.8 42.4	120 144	-- --	-- --														
11	1	0-6 6-12	-- --	-- 18.6	137+ 221+	-- --	-- --														
14	1	0-6 6-12	-- --	27.0 26.5	142 156+	-- --	-- --														
17	1	0-6 6-12	-- --	21.4 24.6	112 66	-- --	-- --														
19	1	0-6 6-12	-- --	29.6 24.5	42 102	-- 0.93	-- 95														
20	1	0-6 6-12	-- --	28.8 28.1	37 101	-- 0.43	-- 43														
21	1	0-6 6-12	-- --	25.9 29.2	32 224+	-- 0.19	-- 43+														
23	1	0-6 6-12	-- --	32.2 27.8	66 71	-- 0.73	-- 52														
27	1	0-6 6-12	-- --	27.3 25.4	189+ 300+	-- --	-- --														
28	1	0-6 6-12	-- --	26.5 20.2	103 286+	-- --	-- --														
30	1	0-6 6-12	-- --	49.0 35.5	45 116	-- 0.49	-- 57														
31	1	0-6 6-12	-- --	33.0 34.6	82 91	-- 0.83	-- 76														
33	1	0-6 6-12	-- --	44.9 41.6	85 150	-- 0.99	-- 149														
37	1	0-6 6-12	-- --	18.6 21.2	152 96	-- 1.00	-- 96														
39	1	0-6 6-12	-- --	16.8 15.6	359+ 750+	-- --	-- --														
41	1	0-6 6-12	-- --	20.5 21.0	142 185+	-- 0.63	-- 117+						88 136				0.63		86		
44	1	0-6 6-12	-- --	25.8 37.2	-- --	-- --	-- --														
46	1	0-6 6-12	-- --	21.0 31.9	85 85	-- 1.02	-- 87														
47	1	0-6 6-12	-- --	18.8 13.8	547+ 750+	-- --	-- --														
48	1	0-6 6-12	-- --	18.8 13.8	487+ 750+	-- --	-- --														
49	1	0-6 6-12	-- --	22.0 20.6	103+ 194+	-- 0.46	-- 89+						82 135+				0.46		62+		+3.0
50	1	0-6 6-12	-- --	24.3 25.1	104 59	-- 1.08	-- 64						61 49					1.08		53	+2.0
54	1	0-6 6-12	-- --	24.5 27.0	93 105	-- 0.99	-- 104						78 89				0.99		88		+2.5
56	1	0-6 6-12	-- --	21.4 22.0	114 148	-- 1.00	-- 148														

(Continued)

\*\*  $c_u$ , ultimate soil-to-soil cohesion;  $\phi_u$ , ultimate soil-to-soil angle of internal friction;  $a_{ur}$ , ultimate soil-to-rubber adhesion; $\alpha_{ur}$ , ultimate soil-to-rubber angle of friction.

† Plus (+) denotes depth of water above surface.

(2 of 8 sheets)

Table A5 (Continued)

Section A. Data								Section B. Soil Data											
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA				USCS				Type	Or- ganic Con- tent %	Spe- cific Grav- ity
Site No.	Map Sheet	Coordi- nates							Texture by Wt. %			Fines %	Atter- berg Limits						
									Sand	Silt	Clay		LL	PL	PI				
59	5154IV	881164	Low	Upland depression	--	--	Cultivated	0-6 6-12	11 9	68 69	21 22	S1L S1L	93 95	80 88	30 30	50 58	CH CH	-- --	2.79 2.78
60	5154IV	881164	High	Upland flat	--	--	Cultivated	0-6 6-12	22 17	73 73	5 10	S1L S1L	84 87	61 62	22 26	39 36	CH CH	-- --	2.69 2.57
62	5154I	903210	High	Upland flat	--	--	Cultivated	0-6 6-12	15 17	76 76	9 7	S1L S1L	87 83	62 66	30 30	32 36	CH CH	-- --	2.67 2.79
63	5155II	856240	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	11 16	78 74	11 10	S1L S1L	94 91	72 73	32 31	40 42	CH CH	-- --	2.66 2.79
64	5155II	895262	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	14 21	86 67	0 12	S1 S1L	90 86	58 58	28 26	30 32	CH CH	-- --	2.79 2.82
65	5155III	791363	Low	Bottomland flat	--	--	--	0-6 6-12	22 18	63 69	15 13	S1L S1L	85 87	61 63	24 24	37 39	CH CH	1.25 --	2.76 2.70
66	5155II	028252	High	Terrace flat	--	--	Cultivated	0-6 6-12	37 40	50 49	13 11	S1L L	73 67	39 40	21 21	18 19	CL CL	-- --	2.74 2.72
67	5155II	961276	High	Terrace slope	--	--	--	0-6 6-12	29 45	51 40	20 15	S1L L	79 63	60 59	27 25	33 34	CH CH	-- --	2.62 2.71
68	5155II	945303	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	17 14	76 80	7 6	S1L S1	90 91	52 52	24 24	28 28	CH CH	-- --	2.67 2.69
70	5155III	765348	Low	Bottomland flat	--	--	Grazed	0-6 6-12	17 15	69 72	14 13	S1L S1L	90 92	72 74	32 33	40 41	CH CH	-- --	2.70 2.66
71	5155III	773402	High	Terrace flat	--	--	--	0-6 6-12	25 29	72 69	3 2	S1L GS1L	72 58	40 38	18 20	22 18	CL CL	-- --	2.68 2.68
72	5155III	837334	High	Lower slope	--	--	Cultivated (idle)	0-6 6-12	33 34	56 56	11 10	S1L S1L	77 76	58 57	24 28	34 29	CH CH	-- --	2.68 2.67
73	5155III	819380	Low	Bottomland flat	--	--	Cultivated (grazed)	0-6 6-12	33 34	60 61	7 5	S1L S1L	75 75	43 44	19 20	24 24	CL CL	-- --	2.66 2.67
74	5155III	773389	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	19 16	76 76	5 8	S1L S1L	86 88	38 46	16 16	22 30	CL CL	-- --	2.66 2.69
75	5155IV	737409	Low	Bottomland flat	--	--	--	0-6 6-12	20 27	64 56	16 17	S1L S1L	86 78	78 63	27 23	51 40	CH CH	-- --	2.54 2.58
77	5155IV	764440	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	25 22	63 67	12 11	S1L S1L	82 83	44 48	16 17	28 31	CL CL	-- --	2.59 2.61
79	5155IV	838501	High	Lower slope	--	--	--	0-6 6-12	72 58	27 38	1 4	LS SL	36 51	22 27	16 15	6 12	SM-SC CL	-- --	2.71 2.68
81	5155IV	788475	Low	Bottomland flat	--	--	--	0-6 6-12	28 24	63 68	9 8	S1L S1L	80 85	46 51	22 20	24 31	CL CH	-- --	2.67 2.69
83	5155IV	782570	High	Lower slope	--	--	Undisturbed	0-6 6-12	60 70	31 22	9 8	SL GSL	42 27	32 31	22 22	10 9	SC SC	-- --	3.12 3.39
84	5155IV	773558	Low	Bottomland flat	--	--	--	0-6 6-12	57 54	40 39	3 7	SL SL	50 53	29 33	16 16	13 17	SC CL	-- --	2.69 2.67
86	5154III	732893	Low	Natural levee	--	--	Cultivated	0-6 6-12	5 5	66 67	29 28	S1CL S1CL	97 97	58 55	26 25	32 30	CH CH	-- --	2.59 2.60
87	5154III	717860	Low	Natural levee	--	--	Cultivated	0-6 6-12	9 8	66 69	25 23	S1L S1L	95 96	55 54	25 25	30 29	CH CH	-- --	2.59 2.59
88	5154I	908135	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	19 22	54 60	7 10	S1L S1L	87 87	76 77	43 44	33 44	CH CH	-- --	2.66 2.59
89	5154II	025884		Terrace flat	--	--	Cultivated	0-6 6-12	14 15	63 60	23 25	S1L S1L	91 89	39 45	21 20	18 25	CL CL	-- --	2.62 2.60
91	5154II	038907	Low	Terrace flat	--	--	Cultivated	0-6 6-12	26 30	64 57	10 13	S1L S1L	83 81	19 26	10 16	9 10	CL CL	-- --	2.59 2.60
92	5154I	107078	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	18 26	67 65	15 9	S1L S1L	88 82	36 40	20 20	16 20	CL CL	-- --	2.55 2.60
93	5154I	080120	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	23 29	68 60	9 11	S1L S1L	85 81	33 39	20 20	13 19	CL CL	-- --	2.62 2.72
<b>Chanthaburi Area</b>																			
100	5448IV	986980	Low	Bottomland flat	--	--	--	0-6 6-12	82 63	13 28	5 9	LS SL	23 41	-- 26	-- 16	NP 10	SM SC	2.16 0.91	2.64 2.66
101	5448IV	987982	High	Upper ridge	--	--	Miscellaneous	0-6 6-12	51 43	27 28	22 25	GSCL VGCL	29 29	40 48	30 31	10 17	SM SM	1.66 1.19	2.70 2.70
109	5448IV	885997	Low	Bottomland flat	--	--	--	0-6 6-12	78 78	20 17	2 5	LS LS	28 27	-- --	-- --	NP NP	SM SM	1.33 0.91	2.62 2.64

(Continued)

(3 of 8 sheets)



Table A5 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition										High-Moisture Condition											
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Depth to Water Table in.
								c <sub>u</sub> psi	Tan $\phi_u$	$\sigma_{ur}$ psi	Tan $\alpha_{ur}$						c <sub>u</sub> psi	Tan $\phi_u$	$\sigma_{ur}$ psi	Tan $\alpha_{ur}$	
59	1	0-6	--	42.9	51	--	--														
		6-12	--	47.2	50	1.28	64														
60	1	0-6	--	30.5	93	--	--														
		6-12	--	27.5	110	1.16	128														
62	1	0-6	--	35.8	56	--	--														
		6-12	--	29.3	131+	1.20	157+														
63	1	0-6	--	44.8	27	--	--						19							+3.0	
		6-12	--	39.7	49	1.33	65						42	1.33	56						
64	1	0-6	--	34.2	59	--	--						59							+3.0	
		6-12	--	30.7	107	1.39	149						96	1.39	133						
65	1	0-6	--	31.6	54	--	--														
		6-12	--	27.5	79	1.06	84														
66	1	0-6	--	26.6	58	--	--														
		6-12	--	27.8	174+	1.29	225+														
67	1	0-6	--	30.5	74+	--	--														
		6-12	--	26.9	159+	1.01	161+														
68	1	0-6	--	28.3	90	--	--														
		6-12	--	24.6	137	0.86	118														
70	1	0-6	--	33.2	101	--	--														
		6-12	--	36.3	129	0.98	126														
71	1	0-6	--	20.6	84	--	--														
		6-12	--	17.2	125	0.71	89														
72	1	0-6	--	38.6	94	--	--														
		6-12	--	30.0	109	1.00	109														
73	1	0-6	--	23.0	107	--	--														
		6-12	--	20.6	12	0.80	74														
74	1	0-6	--	23.8	56	--	--														
		6-12	--	--	69	0.93	64														
75	1	0-6	--	37.0	91	--	--														
		6-12	--	31.1	116	1.09	125														
77	1	0-6	--	25.0	88	--	--														
		6-12	--	26.8	84	1.50	126														
79	1	0-6	--	18.0	217+	--	--														
		6-12	--	12.1	300+	--	--														
81	1	0-6	--	28.8	--	--	--														
		6-12	--	26.4	--	--	--														
83	1	0-6	--	23.2	225+	--	--														
		6-12	--	--	282+	--	--														
84	1	0-6	--	16.2	134	--	--														
		6-12	--	18.2	199+	0.85	169+														
86	1	0-6	--	32.4	96	--	--						94							+4.0	
		6-12	--	28.6	127	1.01	128						113	1.01	114						
87	1	0-6	--	30.2	86	--	--														
		6-12	--	26.4	110	0.85	94														
88	1	0-6	--	36.2	67	--	--														
		6-12	--	34.8	76	0.94	71														
89	1	0-6	--	--	111+	--	--														
		6-12	--	--	190+	--	--														
91	1	0-6	--	--	104	--	--														
		6-12	--	--	100	--	--														
92	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
93	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
<u>Chanthaburi Area</u>																					
100	1	0-6	--	21.0	181	--	--														
		6-12	--	16.4	290+	--	--														
101	1	0-6	--	17.4	171+	--	--														
		6-12	--	16.4	221+	--	--														
109	1	0-6	--	15.0	240+	--	--														
		6-12	--	14.0	178+	--	--														

(Continued)

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Table A5 (Continued)

Section A. Site Data									Section B. Soil Data											
Location			Topog-raphy Class	Topo-graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA Texture by Wt. %				Type	USCS Atter-berg Limits				Type	Or-ganic Con-tent %	Spe-cific Grav-ity
Site No.	Map Sheet	Grid Coor-di-nates							Sand	Silt	Clay	Fines %		LL	PL	PI				
113	5349II	128096	High	Lower slope	--	--	--	0-6 6-12	71 69	21 21	8 10	SL SL	35 36	19 21	19 17	0 4	SM SM-SC	1.10 0.67	2.70 2.66	
116	5448IV	770991	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	49 48	35 38	16 14	L L	59 60	60 52	41 33	19 19	MH MH	4.61 1.83	2.73 2.72	
117	5448III	009778	Low	Bottomland flat	--	--	Cultivated	0-6 6-12	82 77	9 16	9 7	LS SL	21 25	38 38	22 30	16 8	SC SM	3.62 2.87	2.60 2.59	
118	5448III	002774	Low	Terrace flat	--	--	--	0-6 6-12	50 46	41 48	9 6	L SL	64 66	60 79	38 44	22 35	MH MH	-- --	2.65 2.66	
119	5448III	979767	Low	Bottomland flat	--	--	--	0-6 6-12	43 24	38 46	19 30	L CL	60 78	49 57	32 25	17 32	ML CH	3.07 1.06	2.60 2.61	
120	5448III	969788	Low	Tidal flat	--	--	Miscellaneous	0-6 6-12	83 92	14 8	3 0	LS S	20 10	-- --	-- --	NP NP	SM SP-SM	1.67 0.82	2.63 2.68	
124	5448II	874790	Low	Bottomland flat	--	--	--	0-6 6-12	18 20	74 72	8 8	SIL SIL	92 89	32 32	23 26	9 6	CL ML	2.41 4.38	2.60 2.57	
126	5448III	897782	Low	Tidal flat	--	--	Miscellaneous	0-6 6-12	22 30	62 62	16 8	SIL SIL	84 83	73 64	42 36	31 28	OH MH	8.98 6.27	2.55 2.58	
127	5448III	895783	Low	Tidal flat	--	--	Cultivated	0-6 6-12	16 18	72 72	12 10	SIL SIL	90 90	60 67	33 32	27 35	MH CH	5.79 6.20	2.55 2.61	
128	5448III	895824	Low	Tidal flat	--	--	--	0-6 6-12	48 35	52 53	0 12	SIL SIL	58 71	29 42	24 25	5 17	ML CL	0.92 --	2.68 2.62	
129	5448III	903820	Low	Tidal flat	--	--	--	0-6 6-12	71 32	25 46	4 22	SL L	30 71	47 54	34 26	13 28	SM CH	3.41 0.54	2.62 2.65	
131	5448IV	908835	Low	Terrace flat	--	--	--	0-6 6-12	64 65	33 29	3 6	SL SL	38 38	38 40	21 19	17 21	SC SC	1.55 0.75	2.58 2.60	
132	5448IV	882959	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	55 58	34 28	11 14	SL SL	48 44	44 43	31 30	13 13	SM SM	2.15 1.95	2.65 2.64	
133	5448IV	866877	Low	Beach	--	--	Cultivated (idle)	0-6 6-12	84 81	14 17	2 2	LS LS	20 20	-- --	-- --	NP NP	SM SM	1.15 0.71	2.63 2.65	
137	5448IV	900857	High	Terrace slope	--	--	--	0-6 6-12	56 60	31 29	13 11	SL SL	49 46	48 49	28 28	20 21	SM SM	2.67 0.95	2.55 2.59	
138	5448IV	902891	Low	Terrace flat	--	--	--	0-6 6-12	68 71	24 23	8 6	SL SL	34 33	50 49	30 28	20 21	SM SM	2.23 2.47	2.56 2.56	
139	5448IV	911931	Low	Bottomland flat	--	--	--	0-6 6-12	77 80	22 17	1 3	LS LS	25 22	33 33	21 19	12 14	SC SC	2.81 3.00	2.60 2.60	
140	5448IV	896943	Low	Bottomland flat	--	--	--	0-6 6-12	80 83	10 9	10 8	SL LS	21 18	39 27	25 19	14 8	SC SC	1.15 0.70	2.62 2.62	
141	5448IV	895962	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	68 61	26 31	6 8	SL SL	40 49	21 22	20 17	1 5	SM SM-SC	2.67 0.96	2.60 2.64	
143	5448IV	804875	Low	Tidal flat	--	--	--	0-6 6-12	55 41	40 50	5 9	SL SIL	56 68	60 80	38 46	22 34	OH OH	15.32 17.70	2.33 2.32	
144	5448IV	811869	Low	Tidal flat	--	--	--	0-6 6-12	36 39	49 44	15 17	L L	76 71	45 49	13 27	32 22	CL CL	7.25 5.72	2.49 2.50	
145	5448IV	812917	Low	Tidal flat	--	--	--	0-6 6-12	50 37	40 48	10 15	L L	65 75	21 26	21 17	0 9	ML CL	1.20 0.91	2.72 2.67	
146	5448IV	757002	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	54 47	38 45	8 8	SL L	48 59	43 38	25 23	18 15	SC CL	2.23 2.03	2.60 2.51	
147	5448IV	757993	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	61 57	35 36	4 7	SL SL	46 47	23 23	20 --	3 NP	SM SM	2.06 1.55	2.59 2.58	
148	5448IV	752981	High	Upper slope	--	--	Miscellaneous	0-6 6-12	47 55	37 36	16 9	L SL	57 50	54 46	35 35	19 11	MH ML	3.48 1.45	2.65 2.66	
149	5448IV	773974	High	Terrace flat	--	--	--	0-6 6-12	41 56	49 30	10 14	L SL	70 53	58 63	47 47	11 16	MH MH	2.54 1.20	2.92 2.93	
150	5448IV	786958	Low	Bottomland flat	--	--	--	0-6 6-12	54 52	36 36	10 12	SL L	55 56	55 56	41 43	14 13	MH MH	2.74 2.42	2.86 2.87	
151	5448IV	790998	High	Upper slope	--	--	--	0-6 6-12	37 51	51 37	12 12	SIL L	72 59	58 60	44 29	14 31	MH CH	3.14 1.93	2.70 2.74	
152	5448IV	788991	High	Terrace flat	--	--	--	0-6 6-12	55 63	26 24	19 13	SL SL	51 44	44 41	29 26	15 15	ML SM	3.55 7.22	2.58 2.61	
154	5448IV	783984	High	Terrace flat	--	--	--	0-6 6-12	59 48	32 37	9 15	SL L	53 61	58 57	47 44	11 13	MH MH	2.35 2.11	2.75 2.78	
156	5448IV	883960	High	Terrace flat	--	--	--	0-6 6-12	55 53	28 32	17 15	SL SL	51 53	24 23	19 16	5 7	CL-ML CL-ML	1.77 1.39	2.64 2.65	

(Continued)

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Table A5 (Continued)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Dry Density lb/cu ft	Sheargraph				Depth to Water Table in.			
				MC, %	CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi	Tan $\phi_{ur}$		MC, %	CI	RI	RCI		c <sub>u</sub> psi	Tan $\phi_u$	c <sub>ur</sub> psi
113	1	0-6	--	18.5	84	--	--														
		6-12	--	16.6	177	--	--														
116	1	0-6	--	49.8	118	--	--														
		6-12	--	44.5	135	1.01	134														
117	1	0-6	--	21.2	59	--	--														
		6-12	--	17.2	127	--	--														
118	1	0-6	--	31.0	119	--	--														
		6-12	--	40.0	128	0.64	82														
119	1	0-6	--	73.2	--	--	--														
		6-12	--	145.0	--	--	--														
120	1	0-6	--	16.4	145	--	--														
		6-12	--	18.2	108	--	--														
124	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
126	1	0-6	--	100.2	19	--	--														
		6-12	--	77.7	37	0.52	19														
127	1	0-6	--	52.7	42	--	--														
		6-12	--	59.6	56	0.94	53														
128	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
129	1	0-6	--	24.8	176	--	--														
		6-12	--	26.6	110	0.58	64														
131	1	0-6	--	19.6	124	--	--														
		6-12	--	24.4	142	0.59	84														
132	1	0-6	--	30.2	114	--	--														
		6-12	--	23.6	203+	0.96	195+														
133	1	0-6	--	12.7	121	--	--														
		6-12	--	13.4	116	--	--														
137	1	0-6	--	26.1	119	--	--														
		6-12	--	30.3	127	0.49	62														
138	1	0-6	--	28.6	66	--	--														
		6-12	--	16.7	82	--	--														
139	1	0-6	--	23.9	52	--	--														
		6-12	--	20.0	185+	0.45	83+														
140	1	0-6	--	14.5	190	--	--														
		6-12	--	12.6	152	--	--														
141	1	0-6	--	20.9	127	--	--														
		6-12	--	19.1	74	0.46	34														
143	1	0-6	--	63.0	56	--	--														
		6-12	--	99.8	29	0.49	14														
144	1	0-6	--	32.0	124	--	--														
		6-12	--	44.0	82	0.73	60														
145	1	0-6	--	23.3	100	--	--														
		6-12	--	45.6	50	0.64	32														
146	1	0-6	--	24.6	159+	--	--														
		6-12	--	22.6	290+	0.46	133+														
147	1	0-6	--	26.4	95	--	--														
		6-12	--	47.6	170+	0.60	102+														
148	1	0-6	--	33.8	147+	--	--														
		6-12	--	26.2	300+	0.97	291+														
149	1	0-6	--	45.5	231	--	--														
		6-12	--	41.6	216	1.29	279														
150	1	0-6	--	37.0	101	--	--														
		6-12	--	34.6	104	--	--														
151	1	0-6	--	44.9	192	--	--														
		6-12	--	42.8	213	--	--														
152	1	0-6	--	25.6	109	--	--														
		6-12	--	22.2	159	1.23	196														
154	1	0-6	--	54.4	56	--	--														
		6-12	--	52.8	94	1.52	143														
156	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														

(Continued)

(6 of 8 sheets)

Table A5 (Continued)

Section A. Site Data								Section B. Soil Data											
Location			Topog- raphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA			USCS				Or- ganic Con- tent %	Spe- cific Grav- ity		
Site No.	Map Sheet	Grid Coor- di- nates							Texture by Wt. %			Atter- berg Limits							
									Sand	Silt	Clay	Type	Fines %	LL	PL	PI	Type		
157	5448IV	791948	High	Lower slope	--	--	Miscellaneous	0-6 6-12	43 45	45 44	12 11	L L	67 66	57 61	44 46	13 15	MH MH	3.38 3.59	2.84 2.77
158	5448IV	784968	High	Upland flat	--	--	Miscellaneous	0-6 6-12	35 52	52 38	13 10	S1L L	76 56	65 57	46 44	19 13	MH MH	3.88 2.68	2.73 2.81
159	5448IV	807970	High	Terrace flat	--	--	--	0-6 6-12	54 46	31 35	15 19	SL L	51 58	21 36	20 20	1 16	ML CL	2.87 1.35	2.62 2.69
160	5448IV	811969	High	Terrace flat	--	--	--	0-6 6-12	58 58	23 24	19 18	SL SL	46 46	34 37	21 21	13 16	SC SC	2.94 1.24	2.60 2.61
162	5448IV	823969	High	Upper ridge	--	--	--	0-6 6-12	62 57	20 24	18 19	SL SL	44 49	22 22	19 18	3 4	SM SM-SC	2.03 0.96	2.59 2.59
164	5448IV	853963	Low	Terrace flat	--	--	--	0-6 6-12	38 29	41 46	21 25	L L	63 66	40 54	26 29	14 25	ML CH	2.74 1.71	2.72 2.79
165	5448IV	853963	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	63 63	21 23	16 14	SL SL	40 40	32 34	20 20	12 14	CL CL	2.16 1.29	2.53 2.55
168	5448IV	780997	High	Upland flat	--	--	--	0-6 6-12	44 53	46 39	10 8	L SL	66 60	56 61	43 44	13 17	MH MH	2.42 2.12	2.78 2.76
171	5448IV	809007	High	Lower slope	--	--	Miscellaneous	0-6 6-12	71 66	17 24	12 10	SL SL	32 32	42 46	27 28	15 18	SM SM	3.07 1.77	2.53 2.52
172	5448IV	926012	High	Lower slope	--	--	Miscellaneous	0-6 6-12	69 71	24 20	7 9	SL SL	35 31	34 43	19 24	15 19	SC SC	1.61 0.96	2.58 2.65
174	5448IV	845988	High	Lower slope	--	--	Miscellaneous	0-6 6-12	42 51	41 37	17 12	L L	67 59	50 44	32 27	18 17	MH ML	4.71 2.29	2.56 2.62
176	5448IV	805932	High	Upland flat	--	--	--	0-6 6-12	56 61	38 32	6 7	SL SL	53 48	55 55	41 41	14 14	MH SM	2.42 2.22	2.84 2.89
177	5449III	977056	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	32 41	53 42	15 17	S1L L	75 65	36 39	24 24	12 15	CL CL	2.16 1.45	2.58 2.61
178	5449III	973048	Low	Bottomland flat	--	--	--	0-6 6-12	72 71	21 21	7 8	SL SL	39 39	-- 16	-- --	NP NP	SM SM	2.68 0.74	2.57 2.63
179	5448IV	963967	High	Upper ridge	--	--	--	0-6 6-12	71 67	20 22	9 11	VGSL SL	15 40	39 55	20 23	19 32	GC SC	1.15 0.91	2.63 2.61
180	5448IV	939969	Low	Bottomland flat	--	--	--	0-6 6-12	90 85	4 8	6 7	S LS	12 16	26 --	-- --	NP NP	SP-SM SM	1.05 0.91	2.65 2.65
181	5448IV	930969	High	Upper ridge	--	--	--	0-6 6-12	48 39	31 44	21 17	GL BGL	41 28	40 51	23 33	17 18	SC GC	3.82 2.17	2.63 2.63
182	5448IV	825930	High	Upland flat	--	--	--	0-6 6-12	57 58	35 32	8 10	SL GSL	41 36	35 45	26 26	9 19	SM SC	3.27 1.60	2.70 2.76
183	5448IV	853934	Low	Natural levee	--	--	--	0-6 6-12	24 20	52 56	24 24	S1L S1L	82 86	43 47	28 28	15 19	ML ML	2.03 1.83	2.71 2.71
184	5448IV	862943	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	44 40	43 45	13 15	L L	58 58	60 58	29 43	31 15	CH MH	3.75 3.77	2.73 2.76
185	5448IV	858957	Low	Bottomland flat	--	--	Cultivated (idle)	0-6 6-12	23 20	55 55	22 25	S1L S1L	83 86	65 61	44 41	21 20	MH MH	5.39 4.25	2.60 2.60
186	5448IV	923973	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	79 77	13 16	8 7	LS SL	22 26	26 26	-- 19	NP 7	SM SM-SC	2.75 2.35	2.58 2.58
187	5448IV	815892	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	40 42	53 46	7 12	S1L L	75 69	43 59	25 34	18 25	OL OH	8.55 12.67	2.49 2.44
189	5448IV	832933	Low	Bottomland flat	--	--	Undisturbed	0-6 6-12	35 59	40 26	25 15	L SL	73 45	68 56	44 11	24 45	MH SC	7.75 7.82	2.56 2.45
190	5349II	153084	Low	Bottomland flat	--	--	Miscellaneous	0-6 6-12	44 40	39 40	17 20	L GL	67 52	42 47	27 28	15 19	ML ML	4.40 1.45	2.62 2.82
191	5349II	151067	Low	Bottomland flat	--	--	--	0-6 6-12	29 26	48 50	23 24	L S1L	81 83	49 54	27 29	22 25	CL CH	0.87 1.00	2.76 2.73
192	5349II	145044	High	Lower slope	--	--	--	0-6 6-12	65 63	25 28	10 9	SL SL	43 45	24 23	17 17	7 6	SM-SC SM-SC	1.20 0.96	2.61 2.62
193	5349II	138038	High	Lower slope	--	--	--	0-6 6-12	75 78	23 20	2 2	LS LS	36 34	-- --	-- --	NP NP	SM SM	3.59 0.54	2.59 2.62
194	5349II	124028	Low	Bottomland flat	--	--	--	0-6 6-12	56 57	37 36	7 7	SL GSL	55 41	34 28	22 17	12 11	CL SC	3.00 --	2.58 2.79
195	5348I	137992	Low	Tidal flat	--	--	--	0-6 6-12	35 29	60 61	5 10	S1L S1L	64 75	24 27	20 18	4 9	CL-MH CL	1.50 0.86	2.77 2.76
196	5348I	152982	High	Lower slope	--	--	--	0-6 6-12	83 85	17 15	0 0	LS LS	25 23	-- --	-- --	NP NP	SM SM	0.87 0.32	2.59 2.60

(Continued)

(7 of 8 sheets)

Table A5 (Concluded)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph				Dry Density lb/cu ft	MC, %	CI	RI	RCI	Sheargraph*				Depth to Water Table** in.
								c <sub>u</sub> psi	Tan $\phi$ u	a <sub>ur</sub> psi	Tan $\phi$ ur						c <sub>u</sub> psi	Tan $\phi$ u	a <sub>ur</sub> psi	Tan $\phi$ ur	
157	1	0-6	--	60.4	116	--	--														
		6-12	--	46.4	150	0.82	123														
158	1	0-6	--	53.0	130	--	--														
		6-12	--	48.5	130	0.46	60														
159	1	0-6	--	26.6	132+	--	--														
		6-12	--	19.0	229+	0.59	135+														
160	1	0-6	--	28.3	92	--	--														
		6-12	--	24.6	133	1.14	152														
162	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
164	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
165	1	0-6	--	19.1	154	--	--														
		6-12	--	17.4	187	0.64	120														
168	1	0-6	--	40.0	298+	--	--														
		6-12	--	44.2	300+	--	--														
171	1	0-6	--	29.6	130	--	--														
		6-12	--	20.2	151	--	--														
172	1	0-6	--	19.4	107	--	--														
		6-12	--	19.6	235+	0.78	103+														
174	1	0-6	--	38.2	117	--	--														
		6-12	--	30.8	120	1.19	143														
176	1	0-6	--	44.6	75	--	--														
		6-12	--	44.5	108	1.15	134														
177	1	0-6	--	32.6	188	--	--														
		6-12	--	26.0	173	0.79	137														
178	1	0-6	--	29.3	125	--	--														
		6-12	--	20.0	141	0.11	16														
179	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
180	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
181	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
182	1	0-6	--	22.9	176+	--	--														
		6-12	--	16.2	241+	--	--														
183	1	0-6	--	28.4	112	--	--														
		6-12	--	20.4	219+	--	--														
184	1	0-6	--	52.0	86	--	--														
		6-12	--	49.0	109	0.53	58														
185	1	0-6	--	57.2	64	--	--														
		6-12	--	48.6	94	0.76	71														
186	1	0-6	--	18.6	107	--	--														
		6-12	--	15.8	217	--	--														
187	1	0-6	--	40.2	33	--	--														
		6-12	--	91.2	18	--	--														
189	1	0-6	--	110.0	17	--	--														
		6-12	--	66.0	54	--	--														
190	1	0-6	--	32.7	115	--	--														
		6-12	--	17.5	245+	--	--														
191	1	0-6	--	28.7	144	--	--														
		6-12	--	22.6	157+	1.05	165+														
192	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
193	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														
194	1	0-6	--	22.0	170	--	--														
		6-12	--	18.6	202+	1.12	226+														
195	1	0-6	--	18.2	205+	--	--														
		6-12	--	17.8	280+	0.75	210														
196	1	0-6	--	--	--	--	--														
		6-12	--	--	--	--	--														



Table A6  
Terrain-Vehicle Tests  
Summary of Site, Soil, and Trafficability Data

Section A. Site Data								Section B. Soil Data											
Location			Topo- graphy Class	Topo- graphic Position	Slope %	Vegetation	Land Use	Depth of Layer in.	USDA			USCS				Type	Or- ganic Con- tent %	Spe- cific Grav- ity	
Site No.	Map Sheet	Grid Coor- di- nates							Texture by Wt. %			By Wt	Atter- berg Limits						
									Sand	Silt	Clay	%	LL	PL	PI				
Khon Kaen Area																			
HG-1	5560II	661097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	22	49	29	CL	87	38	20	18	CL	--	2.71
								6-12	22	49	29	CL	87	38	20	18	CL	--	2.71
HG-2	5560II	661096	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	41	31	28	CL	67	31	17	14	CL	--	2.68
								6-12	41	31	28	CL	67	31	17	14	CL	--	2.68
HG-3	5560II	662097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	13	45	42	SiC	90	77	38	39	MH	--	2.72
								6-12	13	45	42	SiC	90	77	38	39	MH	--	2.72
HG-4	5560II	662097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	13	38	49	C	90	69	37	32	MH	--	2.72
								6-12	13	38	49	C	90	69	37	32	MH	--	2.72
HG-5	5560II	663097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	31	27	42	C	73	71	35	36	MH	--	2.77
								6-12	31	27	42	C	73	71	35	36	MH	--	2.77
HG-6	5560II	661096	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	14	51	35	SiCL	93	38	21	17	CL	--	2.65
								6-12	14	51	35	SiCL	93	38	21	17	CL	--	2.65
HG-7	5560II	661097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	39	46	15	L	66	24	18	6	CL-ML	--	2.72
								6-12	39	46	15	L	66	24	18	6	CL-ML	--	2.72
HG-8	5560II	661097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	14	62	24	SiL	93	21	--	NP	ML	--	2.63
								6-12	14	62	24	SiL	93	21	--	NP	ML	--	2.63
HG-9	5560II	662097	Low	Bottomland flat	0	Short-grass prairie	Undisturbed	0-6	19	51	30	SiCL	90	40	23	17	CL	--	2.64
								6-12	19	51	30	SiCL	90	40	23	17	CL	--	2.64
SG-1	5560II	688147	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6	47	42	11	L	63	15	--	NP	ML	--	2.60
								6-12	39	45	16	L	69	19	14	5	CL-ML	--	2.58
SG-2	5560II	687144	Low	Bottomland flat	0	Short-grass prairie	Cultivated (idle)	0-6	45	43	12	L	64	21	15	6	CL-ML	--	2.61
								6-12	46	38	16	L	63	25	16	9	CL	--	2.67
SG-3	5560I	691265	Low	Terrace slope	3	Short-grass prairie	Cultivated (idle)	0-6	46	41	13	L	69	20	--	NP	ML	--	2.63
								6-12	50	36	14	L	67	28	17	11	CL	--	2.64
CC-2A	5560I	645400	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6	46	35	19	L	70	20	--	NP	ML	--	2.63
								6-12	63	30	7	SL	61	21	16	5	CL-ML	--	2.63
CC-2B	5560I	646401	Low	Terrace flat	0	Woodland	Undisturbed	0-6	59	35	6	SL	57	--	--	NP	ML	--	--
								6-12	57	30	13	SL	58	20	17	3	ML	--	--
CC-2C	5560I	643399	Low	Terrace flat	0	Woodland	Undisturbed	0-6	68	27	5	SL	45	--	--	NP	SM	--	--
								6-12	61	25	14	SL	51	20	16	1	CL-ML	--	--
CC-4A	5561III	655468	Low	Terrace slope	2	Woodland	Undisturbed	0-6	80	14	6	GSL	18	--	--	NP	SM	--	--
								6-12	79	14	7	VGLS	13	--	--	NP	SM	--	--
CC-4B	5561III	655472	Low	Terrace slope	2	Woodland	Undisturbed	0-6	82	13	5	LS	26	--	--	NP	SM	--	--
								6-12	79	16	5	LS	29	--	--	NP	SM	--	--
CC-5A	5561III	662472	High	Upper slope	5	Barren	Undisturbed	0-6	41	20	39	CL	63	55	19	36	CH	--	--
								6-12	47	16	37	SC	61	60	19	41	CH	--	--
CC-5B	5561III	661472	Low	Lower slope	5	Tall-grass prairie	Undisturbed	0-6	72	14	14	SL	43	24	17	7	SM-SC	--	--
								6-12	58	11	31	SCL	57	36	15	21	CL	--	--
CC-5C	5561III	658472	Low	Bottomland flat	0	Short-grass prairie	Cultivated (rice)	0-6	54	34	12	SL	59	19	15	4	CL-ML	--	--
								6-12	53	30	17	SL	61	21	15	6	CL-ML	--	--
CC-5D	5561III	657472	Low	Terrace slope	3	Woodland	Undisturbed	0-6	79	14	7	LS	30	--	--	NP	SM	--	--
								6-12	73	11	16	SL	37	22	12	10	SC	--	--
CC-5E	5561III	653472	Low	Terrace slope	3	Woodland	Undisturbed	0-6	81	17	2	LS	27	--	--	NP	SM	--	--
								6-12	81	16	3	LS	27	--	--	NP	SM	--	--
M-1	5560I	684320	High	Upland flat	0	Woodland	Undisturbed	0-6	78	18	4	LS	34	13	14	NP	SM	--	--
								6-12	75	18	7	SL	36	--	--	NP	SM	--	--

(Continued)

\* G = gravelly; VG = very gravelly.

Table A6 (Concluded)

Section C. Trafficability Data																					
Wet-Season Condition												High-Moisture Condition									
Site No.	No. of Visits	Depth of Layer in.	Dry Density lb/cu ft					Sheargraph**				Dry Density lb/cu ft					Sheargraph**				Depth to Water Table† in.
				MC, %	CI	RI	RCI	c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\alpha_{ur}$		MC, %	CI	RI	RCI	c <sub>u</sub> psi	Tan $\phi_u$	a <sub>ur</sub> psi	Tan $\alpha_{ur}$	
Khon Kaen Area																					
HG-1	1	0-6	--	28.3	135	0.72	97	3.0	0.23	--	--	--	28.3	135	0.72	97	3.0	0.23	--	--	0
		6-12	--	28.5	313+	0.58	182+	--	--	--	--	28.5	313+	0.58	182+	--	--	--	--	0	
HG-2	1	0-6	--	26.6	71	0.68	48	2.9	0.40	--	--	--	26.6	71	0.68	48	2.9	0.40	--	--	0
		6-12	--	26.5	165	0.67	111	--	--	--	--	26.5	165	0.67	111	--	--	--	--	0	
HG-3	1	0-6	--	29.2	86	0.48	41	0.2	0.18	--	--	--	29.2	86	0.48	41	0.2	0.18	--	--	+1
		6-12	--	31.6	175	0.43	75	--	--	--	--	31.6	175	0.43	75	--	--	--	--	0	
HG-4	1	0-6	--	26.6	139	0.70	97	1.5	0.22	--	--	--	26.6	139	0.70	97	1.5	0.22	--	--	0
		6-12	--	30.1	246	0.58	143	--	--	--	--	30.1	246	0.58	143	--	--	--	--	0	
HG-5	1	0-6	92.3	27.5	142	0.80	114	1.7	0.40	--	--	92.3	27.5	142	0.80	114	1.7	0.40	--	--	0
		6-12	--	31.0	180	0.74	133	--	--	--	--	31.0	180	0.74	133	--	--	--	--	0	
HG-6	1	0-6	99.3	24.0	44	0.70	31	0.0	0.16	--	--	99.3	24.0	44	0.70	31	0.0	0.16	--	--	0
		6-12	98.4	25.5	115	0.66	76	--	--	--	--	98.4	25.5	115	0.66	76	--	--	--	--	0
HG-7	1	0-6	104.1	21.7	73	0.62	45	1.2	0.18	--	--	104.1	21.7	73	0.62	45	1.2	0.18	--	--	0
		6-12	--	19.9	207	0.45	93	--	--	--	--	19.9	207	0.45	93	--	--	--	--	0	
HG-8	1	0-6	100.5	21.5	111	0.61	68	0.0	0.34	--	--	100.5	21.5	111	0.61	68	0.0	0.34	--	--	0
		6-12	--	22.4	299	0.77	230	--	--	--	--	22.4	299	0.77	230	--	--	--	--	0	
HG-9	1	0-6	97.2	23.4	45	0.60	27	0.0	0.18	--	--	97.2	23.4	45	0.60	27	0.0	0.18	--	--	0
		6-12	--	28.0	138	0.61	84	--	--	--	--	28.0	138	0.61	84	--	--	--	--	0	
SG-1	3	0-6	102.0	17.3	96	0.43	36	1.3	0.37	0.3	0.40	106.9	17.0	72	0.33	24	0.0	0.27	0.0	0.27	+2
		6-12	109.6	16.6	182	0.46	74	--	--	--	--	107.0	18.4	161	0.38	61	--	--	--	--	0
SG-2	1	0-6	103.6	17.1	85	0.51	43	2.2	0.55	0.0	0.47	103.6	17.1	85	0.51	43	2.2	0.55	0.0	0.47	+2
		6-12	--	--	174	--	--	--	--	--	--	--	174	--	--	--	--	--	--	--	0
SG-3	2	0-6	102.6	20.7	111	0.68	76	2.0	0.33	0.6	0.30	103.4	20.4	104	0.56	58	1.2	0.30	0.3	0.27	+3
		6-12	95.1	25.2	139	0.72	98	--	--	--	--	--	24.1	142	0.62	88	--	--	--	--	0
CC-2A	2	0-6	99.6	21.3	79	0.47	36	0.5	0.32	0.0	0.34	108.0	18.2	72	0.63	45	0.5	0.32	0.0	0.34	+6
		6-12	107.8	17.9	133	0.33	46	--	--	--	--	106.4	18.7	86	0.26	22	--	--	--	--	0
CC-2B	1	0-6	110.7	14.0	225	--	--	2.7	0.36	1.0	0.32	--	--	--	--	--	--	--	--	--	0
		6-12	104.1	13.3	237	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-2C	1	0-6	101.6	11.1	214	--	--	1.6	0.55	0.0	0.51	--	--	--	--	--	--	--	--	--	0
		6-12	107.6	13.0	239	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-4A	1	0-6	--	--	399+	--	--	0.2	0.38	0.2	0.42	--	--	--	--	--	--	--	--	--	0
		6-12	--	--	699+	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-4B	1	0-6	--	9.5	169	--	--	2.3	0.36	1.5	0.25	--	--	--	--	--	--	--	--	--	0
		6-12	--	--	130	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-5A	1	0-6	--	20.4	616+	--	--	--	--	0.0	0.36	--	--	--	--	--	--	--	--	--	0
		6-12	--	20.1	750+	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-5B	1	0-6	98.2	10.5	365	--	--	2.0	0.47	0.0	0.47	--	--	--	--	--	--	--	--	--	0
		6-12	105.3	17.1	296	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-5C	1	0-6	109.2	17.2	98	0.32	31	2.8	0.34	1.2	0.23	109.2	17.2	98	0.32	31	2.8	0.34	1.2	0.23	+3
		6-12	99.1	20.9	136	0.43	58	--	--	--	--	99.1	20.9	136	0.43	58	--	--	--	--	0
CC-5D	1	0-6	--	12.2	145	--	--	2.0	0.45	0.6	0.38	--	--	--	--	--	--	--	--	--	0
		6-12	--	14.9	188	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0
CC-5E	1	0-6	94.8	23.2	33	0.36	12	2.4	0.40	0.6	0.38	94.8	23.2	33	0.36	12	2.4	0.40	0.6	0.38	0
		6-12	100.5	19.3	46	0.75	35	--	--	--	--	100.5	19.3	46	0.75	35	--	--	--	--	0
M-1	2	0-6	102.0	12.5	154	--	--	2.0	0.42	0.6	0.40	--	--	--	--	--	--	--	--	--	0
		6-12	99.8	12.7	129	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0

\*\* c<sub>u</sub>, ultimate soil-to-soil cohesion;  $\phi_u$ , ultimate soil-to-soil angle of internal friction; a<sub>ur</sub>, ultimate soil-to-rubber adhesion;  $\alpha_{ur}$ , ultimate soil-to-rubber angle of friction.  
† Plus (+) denotes depth of water above surface.

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11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY U. S. Army Materiel Command
13. ABSTRACT Pertinent soil trafficability data were collected during the wet season at 846 sites in Thailand. The soils were identified according to the Unified Soil Classification System and the U. S. Department of Agriculture textural classification system. Two general topographic positions (high topography and low topography) and two general levels of wetness were considered. A scheme for classifying soils according to their trafficability was developed. The scheme lists the soil types in order of decreasing trafficability under each of three topography-wetness level categories and shows the probability of successful passage on each soil for vehicles of known soil strength requirements. The scheme permits the estimation of the probability of a successful operation for given soil type, topography, and wetness-level conditions. If a choice of several routes and vehicles is available, the determination of the vehicles with the best chances of success over a given route or of the best route for given vehicles can be made.		

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